THE
SCHOOL JOURNAL
ORGAN OF THE DEPARTMENT OF COMMON SCHOOLS AND OF THE STATE TEACHERS' ASSOCIATION.

Vol. 34. DECEMBER, 1885. No. 6.

AN EXPERIMENT IN PRIMARY EDUCATION.—II.

BY DR. MARY PUTNAM-JACOBI.

ONLY one attempt was made during this year to teach the child the meaning of words. It was done through a simple generalization which had become indispensable in the study of geometry, when she passed from plane to solid figures. By means of wooden models she learned, in addition to the cube—the sphere, ovoid, oblate, cylinder, prism, tetrahedron, octahedron, and dodecahedron. She then was led to make parallel lines of plane and solid figures with a corresponding number of sides or angles, then to abstract the Greek numerals *tri*, *tetra*, *penta*, *hexa*, etc., found to belong to both columns, and set this in the centre, with the syllable *gon* on one side, and *hedron* on the other. An hour was required to complete the setting out of these figures, and arranging these titles with movable letters, which for the first time the child learned to use for spelling. The exercise was, of course, repeated again and again, until every step was perfectly familiar. From the beginning the child had no difficulty in connecting the plane and solid figures, nor in learning the numerals appropriate to each. The new effort at abstraction and classification was at first somewhat hard, but soon became easy. The facility with which the impression of forms may be made upon a child's mind, when this is as yet uncrowded by notions on the other qualities of objects, was shown by a little incident at this period. A few weeks after having made her first acquaintance with the oblate, she saw at dinner for the first time some small stewed onions. "Oh!" she exclaimed, "they have brought us some oblates for dinner." Another day, when she accidentally pulled the cord of a window-shade in a certain position she observed that she had thus made "two scalene triangles." Looking at the ceiling above a lamp, she called to me to notice how the light made three "beautiful concentric circles."

One other study during the year was made upon the intrinsic meaning of words. In the course of some observations on plants the child had learned to recognize the ovary and ovule, and to herself dissect them out of a flower. When this had been done, the analogy between the vegetable ovule and chicken-egg or ovum was easily pointed out, and the relation of the latter to the geometric ovoid. The four objects were then placed in a row on the table, the names of each spelled with movable letters, and then the common root *ov* described and taken out. The important and fundamental idea was thus grasped that there was an intrinsic meaning to at least some words, and also that objects associated by a common name, whose specific variations were of subordinate importance, must be classed together as deeply related, notwithstanding superficial difference of aspect. But this idea, once distinctly enunciated and understood, was then set aside for a season. That the idea was understood, I tested in the following way: At table the child re-

marked that a particular potato was "shaped like an egg." "What shall we then call it?" I asked. "An ovoid," was the reply. "Very good. Do you know what I thought you might call it?" "An ovum," she answered, with an air of mischievous triumph. "And why did you not?" "Because it is not an egg, but only shaped like an egg." I tempted the child with the suggestion that she should tease the waiter by asking him to bring us some ovules instead of eggs; but the instinctive modesty of childhood recoiled from the pedantic proposition.

The necessity for precision in the use of terms, thus initiation into scientific terminology, was enforced incidentally on another occasion. A playfellow much older than the child picked up a piece of mica and called it isinglass. This conventional inaccuracy I strongly rebuked, and, procuring a piece of real isinglass, led the child to note its difference, and to condemn in private and without malice the slovenly language of her presumably untaught comrade. Now, the child had a doll called Rosa, and was in the habit of illustrating any absurdity by pretending that Rosa was guilty of it. Some time after the conversation on the isinglass she was watching a stream of water falling in the sunlight from a hose. She exclaimed: "See the beautiful silver water coming from the old gray hose. Rosa would have called that mica!"

When the box of wooden geometric models was thoroughly mastered, after about six months' study, I procured for the child a set of models of crystals, such as are used for studying mineralogy. About half of these proved too complex for study, but the child easily learned to recognize and distinguish twenty-six, partly simple, partly compound forms. As each face of the crystal showed some plane figure which she had already learned, and as she was also familiar with the Greek numerals from three to twelve, it was generally easy for the child to devise the name of the crystal, even when apparently so repelling as a scalenhedron, rhombic, dodecahedron, right rhombic pyramid, etc. It was interesting to notice her capacity to discern the general outline of a crystal and thus its generic features, and afterward to distinguish the secondary divisions of its sides, or the specific characters; thus in a four-faced cube, a three or six-faced tetrahedron, a three-faced octrahedron, etc. The forms in the four systems of crystallization were learned by repeated handling of the models, until the child's perceptions had become saturated with them, and she could, for instance, discover for herself four-faced cubes in the curved moulding on staircases. Then, at the beginning of the second year, the crystals began to be copied in clay, and opportunity then afforded for studying their axes, or the basis of their classification, by means of long pins thrust through the soft model in appropriate direction.

Arithmetic, the second science in Dr. Hill's category, was begun several months after the first studies of form and outline. Instead of the beans so frequently recommended, the child used sticks of different sizes and colors. For two or three months she studied such numbers as seem almost to form natural complex entities, and hence have often been sacred numbers, thus: four, nine, ten, twelve, twenty-four, thirty-six. The child was exercised in dividing these up into symmetrical groups, whose resemblances she was trained to tell at a glance by the eye, before enumeration. Thus she learned to form groups of threes, fours, and sixes, and to unite them in as many fantastic combinations as could be invented. The object was to effect the transition from the perception of form to the conception of number by a series of visual impressions as vivid as possible. The breaking up of a whole into parts really precedes in facility the additioning of parts into a whole, for the reason that the power of destruction in a child obviously precedes the power of construction. Froebel's fifth gift of cubical blocks has its first application on this fact, since the entire mass forming a cube may be broken up into twenty-seven smaller cubes. When we reached the number twenty-seven, I told the child it was the smallest cube that existed. But she having a year previously, when only four years old, learned to handle these same cubes, corrected my error, and demonstrated triumphantly that eight blocks would make a still smaller cube. The incident shows the tenacity of ideas once implanted in the right way and at the right time.

It is much more difficult to teach a child to subtract than to add, a fact upon which Warren Colburn sagaciously comments. In the discussion of practical problems, a hitch often occurs in the child's mind which may be quite unsuspected by the teacher. Thus, if Henry and Arthur go to buy a ball which costs sixteen cents, and one boy had six cents and the other seven, I found the child unable to solve the problem as to how many more cents were needed, because, as

she said, she could not take thirteen from sixteen, since the very trouble was that the boys did not have sixteen cents. It was necessary to use sticks, and with the distinct formal agreement that those of one color should be known to represent an imaginary number, those of another color the number of actual things manipulated. But what a stride for a young child's mind to make, into a sphere neither real nor imaginary, but where the existent and non-existent are indissolubly associated in an ordinary practical affair of every-day life!

From the beginning the decimal system imposed itself spontaneously upon the child's mind, on account of the facility of visibly recognizing groups of five and ten sticks, and of verbally recognizing their successive additions. In this way the multiplication-table—the famous despair of little Marjorie Fleming—was mastered with great ease by this far less gifted child. Every one remembers the fierce vehemence of Pet Marjorie's protest, "But 7 times 9 is devilish, and what Nature itself can't endure!" It is so, if presented as an isolated fact. The child I taught, however, discovered of herself that the successive addition of tens was as easy as that of ones. After that, when she came to add (or multiply by) nines, she would say, first add ten, then say, and nine was one less. If it were eight, it was two less, etc. After a fortnight of these exercises, she was asked one day out of study-hours what was the sum of 14 and 19, and answered immediately 33. Upon being asked to explain the process, she said, "10 and 19 makes 29, then I must add 4 more, and 1 and 29 are 30, and 3 more are 33." When three decimals were reached, a somewhat laborious exercise was performed. Thus, to operate with 138, the number 100 was constructed out of ten packages of purple sticks, each package containing ten sticks. These packages were placed in a row; underneath was a second row, containing, to represent the number 30, three packages of yellow sticks, each containing ten; finally, a third row of eight units was made with green sticks in a single series. In this exercise the sticks were all of the same size; in another, later, a hundred was represented by a single long stick, usually purple, a ten by a yellow stick next in size, a unit by a stick still smaller and green. Thus the original and clumsier representation was condensed by the substitution of an expressive sign for the literal numbers; and as soon as the sticks became used as signs, and not as the objects really to be counted, the mutual relation of their respective sizes also ceased to be literally exact, and became merely schematic. Thus was gradually managed a transition to the use of pure written signs or symbols. The transition initiated and enlarged the condensation of Roman into Arabic numerals. Knowledge of the process of subtraction, especially in three and more decimals, was essentially faciliated by this device with sticks, and the terrible difficulty of borrowing ten quite overcome. Thus, if the number 288 were to be taken from 362, the larger number would be represented by three long purple sticks, six shorter yellow sticks, and two green sticks, the shortest of all. These colors were always selected because harmonizing so well with each other. Then, similarly, the 288 was represented by two purple, eight yellow, and eight green sticks. It was easily recognized by the child, that one of the yellow sticks could be removed from the ten sections of the 362, and ten green sticks substituted, bringing the entire number of units up to twelve, from which the eight of the lower figures could be taken. It was also obvious that, when one yellow stick had been taken away, only seven remained. There was no need, therefore, to employ the usual confusing statement that a ten must be borrowed from the upper figures, and later restored to a different place in the lower.

The study of abstract numbers, with Colburn's arithmetic, was begun when the child was five and a half years. At the end of a year she had thoroughly mastered the first four rules, including both "short" and "long" division, and was considerably advanced in the study of fractions, proper and improper.

The last study entered upon during this year was that of natural objects, and, for obvious reasons, plants were chosen for this purpose. I suppose that most persons seriously interested in education are acquainted with Miss Youmans's admirable little "First Lessons in Botany," and the plea she makes for this science as a typical means of training the observing powers of children. According to her plan, the first object studied is the leaf—and the pupil is taught at once, not only to draw the leaf, but to fill out a schedule of description of it. Much may be said in favor of this method, which proceeds from the simple to the complex form, but it is by no means the only possible one; the writing part of the scheme is, moreover, impossible for a child who has not yet learned how to write. There is

another method which consists in seizing at once upon the most striking aspect of the subject, and which shall make the most vivid impression upon the imagination. For this purpose the leaf is the least useful, the flower the most so. The earliest botanical classifications are based upon the corolla, and, in accordance with a principle already enunciated, a child may often best approach a science through the series of ideas that attended its genesis. The conditions are different for an adult, who requires to get the latest results; the child's mind is always remote from these, but often singularly near to the conceptions entertained by the first observers. Again, it is unnatural to enter upon the beautiful world of plants by the study of forms and outlines—which is much better pursued when abstracted from all other circumstances, as in models of pure mathematical figures. But with plants comes a new idea—that of life, of change, of evolution. It is fitting that this tremendous idea make a profound impression on the child's mind; and this impression may be best secured by watching the continuous growth of a plant from the seed. The study of life is a study of events, of dynamics, of catastrophes. The earliest observation perceives the extraordinary influence of the surrounding medium upon the destinies of the living organism. It is not difficult to surround these destinies with such a halo of imagination as shall impress on the mind a sense of the mystery, sanctity —I may add, the necessary calamities of life—before it has become absorbed in the consideration of living personalities.

I trust it will not seem a piece of bathos when I add that I initiated the pursuit of these objects by making the child watch the growth of seven beans on a saucer of cotton-wool. A specimen bean was first dissected, and its principal parts named—the cotyledons, the embryo with its radicle and plumula, the episperm. The daily reference to these terms speedily rendered the child quite familiar with them. To seven other beans were given appropriate names, as of a band of brothers, and they were then planted on cotton-wool by the child. A daily journal of events was opened, in which I wrote each day or two, at the child's dictation. As she had learned the Arabic numerals, she inserted these herself in the protocol whenever necessary. The entire history of each bean was thus written out, and the successive steps of its development, from the thrilling moment when the radicle first peeped out, to the time when, after transplantation to a flower-pot, the plumula had developed to a long, trailing vine. The rate of growth of this vine was measured day by day exactly, with a rule, the number of leaves counted, etc. But the mathematical considerations were here subordinated to a larger idea, that of succession of events. Some of the beans molded early in their career, and the relations of this catastrophe to the accidental differences of position, moisture, etc., were carefully studied. On one occasion the child dictated to me the following entry for the journal: "The episperm, on the under surface of Tertius, is all black, and has split, leaving a space the shape of an equilateral triangle, with an apex pointing to the convex edge of the cotyledons." In the summer, when flowers could be obtained from the woods in abundance, the child made collections of ovaries and ovules, and was never tired of finding the latter asleep in their beds, in so many differently shaped houses. At this time the static considerations were allowed to predominate, and the child rather forgot the function of the embryo seeds—so much so that, upon seeing some small pieces of ice lying in half a musk-melon, she said that these were like the ovules in an ovary. At the beginning of the second year, the study of plant growth was resumed with seven hyacinths, that received appropriate names, as seven sisters. The first lesson in written expression coincided with the beginning of this new study; for now the child was allowed to write the plant-journal herself. The exercise was complex. The child first examined the hyacinths, and noted whether anything had transpired since the last observation. She then framed a spoken sentence, in which such an event was accurately described. She then dictated the writing of this sentence as a whole, which she was afterward to copy. During this dictation, some knowledge of spelling was incidentally acquired; for the child was led to spell by sound, and without reference to silent letters. The words she had not yet seen. Finally, when fairly at work at the writing, the meaning of the sentence was temporarily ignored, and attention closely concentrated upon the forms of the letters, and no mercy shown to inaccurate imitation of them. Thus, one day she entered the observation that Blanche, in a blue glass, had grown much more vigorously than Aura, in a dark one; and a blue glass was given to the less favored sister, in the hope that she would improve. She noted that the tips of the white roots were gray and

conoid in shape (making the observation herself independently), and was allowed to demonstrate the function of these tips by cutting one off and seeing the growth of that root arrested. On another day she first discovered, then described, then wrote down, that the first broad leaves of Blanche had split open, showing two others at right angles to them. This was her first perception of this remarkable law of phyllotaxy, and she herself illustrated it by making two loops with the thumb and finger of each hand, and making them intersect each other. The previous acquisition of mathematical conceptions was constantly shown to facilitate and render precise her observations of complex objects.

It was rather as a concession to a prevailing prejudice that at this time the child was taught to read. This study, usually made of the most importance, was held for this child to be quite subordinate and easy, and little stress laid upon it. The child was allowed to follow her own inclination, to divine the subject of the chapter from the picture at the head of it, and, to a considerable extent, the words in each sentence from the context; when the wrong word was thus suggested, she was obliged to spell out the real word by sounds, always seeking first the central or predominant sound, and building up the word around it, instead of enumerating the letters in order. Thus in the word *scratch* she took out the letters *a t*, as the central nucleus, preceding the first by the sound of *r*, then of *c*, then of *s*; then, when the sound *scrat* was complete, adding that of *ch*. She was made to read as much and as rapidly as possible, relying upon constant repetition and association of ideas to secure familiarity. Thus unconsciously the conception was continued, that written as well as spoken language was an outgrowth of thought, before the attempt was made to study it as an object of thought. This method is like that of learning to walk before studying the laws of Weber on locomotion.

This method may seem slovenly, but, after all, it is both the natural and scientific method of studying an unknown tongue, which must be deciphered by the context. How else did Champollion read the Rosetta stone, or Eliot find a written language for his Indian Bible? Throughout this period the task of reading was treated as something so easy as to be insignificant, and was so regarded by the child herself.* The main intellectual work of the day's lessons (whose duration was never more than an hour and a half) was concentrated upon the arithmetic, map-drawing, analysis of flowers, and the geometrical studies, that she now pursued by the help of Hill's "First Lessons," and Spencer's "Inventional Geometry." She studied angles, vertical and adjacent, the relations of angles and circles, and the measurement of the former by the latter. Exercises in these were practiced daily with compass and ruler; and, when lines drawn with the pencil failed to give a large enough visual impression, they were designed with colored sticks. This enlargement of the material illustration never failed to clear up any obscurities. At the time these notes cease, the child was six and a half years old.

I have tried to make clear in these few notes the outlines of a (single) experiment, which seems to me to show that the mental education of even a very young child may be imbued with scientific methods and even ideas which should furnish suitable preparation for advanced scientific studies. It can not be a matter of indifference that such habits of mind are acquired from the beginning, or only after much previous faulty training. What comes first will always remain the most important, will always dominate the rest. Experience in the medical education of women has repeatedly brought home to me the difficulty of teaching such an art as medicine to persons who come to it through the prevailing systems of school discipline, especially those which are applied to girls. Experience with one little girl at least convinces me that the aptitude for vivid and accurate perception, and for scientific method in ideas, often exists where unsuspected, and only demanding proper cultivation.

As an illustration of the method described in the text, when carried into more complete studies, I insert an exercise written by the child when six and a quarter years old. It is a description of wild Iris, which she analyzed herself on successive days, writing down the results from *memory* on the next day. She was never told anything, but obliged to discover for herself each fact, to compose the sentence describing it, and to spell by ear the words of the sentence without copy. She was allowed to insert in her description whatever fancies occurred to her. The headings and order of evolution of the subject were alone dictated. With nearly all the technical terms she was, however, already familiar; two only were told —"perianth," as opposed to corolla, and

* What is easy when taken instinctively, may be incredibly difficult when itself becomes the object of thought and study.

"blade." Before analyzing the Iris she was obliged to take a long walk to the woods for it, and first to draw a map showing the way, and by means of the compass. Two intersecting lines from sight objects were dictated by me, and the fact learned by this and another previous experiment which had failed, that to locate an object in space at least two lines are required. The final description, whose writing occupied two or three weeks, was as follows:

The Rainbow Family.—(This name was given as a literal translation of *Iridaceæ*, and as a return in a spiral to the first natural object studied eighteen months before, the rainbow. The way was also prepared for the future historical study of the myth of Iris.)

Iris Tricolor.—(The numeral was already familiar.)

Perianth=6 Petals.—(The algebraic signs and numbers were used to indicate that in a scientific document, not a flowing style, but the fewest words and most concise expressions, were required.)

These stand on top of a long tube in which the style is locked in. There are two kinds of petals: 1 Three which are the biggest, and have three colors. There are two parts to each—the upper broad part called the blade, and the lower long narrow part. (The term "blade" was here taught for the first time.) The blade is first purple; in the middle is a gold stripe which runs into the narrow part. (At this point, the child drew and painted from memory, on the margin of her protocol, a picture of the petal.) Between the purple and gold the blade is white. These petals curve outward and downward, so that the gold stripe comes on top. The bees see it and come for the pollen. (First introduction of a Darwinian law.) 2. Three petals, which are entirely purple, are vertical, smaller, and stand between the others. (The child made another drawing by opening the flower on the page and tracing its outlines.) It is as if six girls were standing in a circle (here was introduced a botanical outline of the whorl, instinctively devised by the child, the circle being drawn accurately with compasses). Every other one leans back and stretches her arms out horizontally, as if to show her gold bracelet. The three others lean forward, and hold their arms up above their heads. (Prolonged contemplation of this lovely group tended to evoke such instinctive æsthetic conceptions as are at the basis of many pieces of statuary, notably Thorwaldsen's Graces.) The gold stripe is like the orange feathers on the head of the bee-martin. The bees think it is a flower, and come and settle on the bird's head; then he catches them. (This illustration was suggested by the child, shortly after having seen such a bird which had been shot. She thus learned to step from one section of natural history to another, and also to seek analogies of organs in their functions.) Mamma says (here knowledge by testimony is distinguished from that obtained by personal observation, which has not yet reached so far) that all flowers that want the bees to visit them have bright colors. This is like ladies who want the gentlemen to visit them, and then put on their finest clothes.

The Great Mistake.—We thought there were three more petals in the middle of the corolla. These were smaller than the others, and divided at the top like a funny M. (The child then made a drawing in illustration.) Each stands inside a gold-striped petal, and has a groove on the other side like a bath-tub. In this is a princess bathing. She is a stamen, with a long, whitish anther like a veil over her head. So there are three stamens inserted with the petals.

How we found out the Truth.—(This process is introduced with some solemnity, as befits its importance.) 1. We looked to see how the pollen got on the stigma. (Introduction to the biological methods of studying structure in association with function.) 2. We noticed that the pollen could slip down the groove into the tube leading to the ovary. 3. We saw that the petal-like pieces were fastened together in the middle of the perianth, making a solid white cylinder which passed into the green tube. (Another drawing from memory illustrated this.) 4. It was plain that the white cylinder was the style, because it went to the ovary. 5. Then mamma said (recognition of authority and testimony again) that the petal-like pieces were the stigma, immensely big. (The incident showed the function of the reason in unraveling the deceptions imposed by the senses and the superficial aspect of things.)

Ovary—at the bottom of the tube (ovary inferior)—has three lodges and a great many ovules.

(Thus the botanical analysis was rigidly accurate and complete. But, instead of being a dry schedule, it comprised a mass of vivid, glowing impressions destined to remain forever as a typical group of ideas in the child's mind. The prolonged, patient, sympathetic study of the individual preceded the abstract study of a class of flowers. In the future it was intended that the child should construct her own classes from among the botanical individuals she should really learn to know.)

WEEP not that we must part;
Partings are short; eternity is long;
Life is but one brief stage,
And they that say love ends with life are wrong,
List to thine own heart's cry—
Love cannot die.

What though so far away?
Thy thoughts are still with me and with thee mine,
And absence has no power
To lessen what by nature is divine.
List to thine own heart's cry—
Love cannot die.

Then grieve no more, my love!
Grieving but shows thy trust in me is small—
Faith is by calmness proved,
For know this truth—thou canst not love at all
Unless thine own heart cry—
Love cannot die.

TEACHING PRIMARY READING.—I.

BY DR. EDWARD BROOKS.

THAT the art of Reading is not well taught in our public schools goes without saying. That reading is a beautiful art and should be well taught is also readily admitted. Cannot something be done to improve our methods of teaching the art, is a question that rises spontaneously in many a teacher's mind. Believing that great improvement is possible here, I have prepared two or three articles, in which I endeavor to make some practical suggestions that may aid in the adoption of better methods or the improvement of old ones already in use. The attention of younger teachers especially is invited to these suggestions, and they are earnestly requested to give them a careful trial to see whether the beautiful art of expressing thought and sentiment from the printed page cannot be taught with greater interest and better results.

In these articles I have endeavored to present a complete outline of the leading ideas and principles with which every teacher of the art should be familiar. While some of the suggestions will no doubt be new, I shall at the same time repeat some things that are old, both for their intrinsic excellence and for the completeness of the method which I shall outline. The old is often more valuable than the new; but being overlooked or neglected, needs to be repeated in order to insure its actual use in our work of teaching. Besides, the old in the new setting of a complete system often comes to the mind with a new significance and value that lead to an increased appreciation and a more intelligent practice of it. When the new and the old are blended together in an organized system giving life and significance to the whole, the teacher's mind ought to be filled with new light and his work vivified with new life.

A fundamental qualification in teaching an art like reading is a clear conception of two things: the *nature of the art* and the *methods of teaching* the art. By the Nature of the Art is meant the different elements that enter into it and their relation to each other. These may be so presented as to afford a comprehensive and detailed view of the entire subject to be taught; and such a view will give the teacher a clear idea of just what is to be attended to, and enable him to see what means to adopt to secure the end aimed at. By the Nature of Teaching the Art is meant a general view of the means and methods needed to unfold the various elements and guide the teacher in training his pupils to correct practice and in giving proper culture. A brief statement of each of these will be given in the order named.

THE ELEMENTS IN READING.

An analysis of the art of elocution or delivery in general, leads to a threefold division of the subject. First, there must be a *mind* to think the thought to be expressed; second, there must be a *voice* to express it; third, there must be a *body* to aid in the expression. This gives us the three great elements of the art—the Mental Element, the Vocal Element, and the Physical Element. The relation of these three elements will be readily seen. First, the mind must have a correct and vivid conception of the thought or sentiment; second, the voice must fitly express what the mind has vividly conceived; third, the body, by attitude, gesture, and facial expression, should enforce the utterance of the voice.

All of these three elements enter into the art of reading or vocal delivery, and each of these elements requires the careful attention of the teacher. In recitation and oratory the physical element is of very great value; but in ordinary reading it is of less importance and requires less attention. In the following articles I shall endeavor to show the teacher's work in each of these three elements; the remainder of this article will be devoted to the presentation of some general principles of instruction in the art that will guide the teacher in his work in all these elements or divisions of the subject.

PRINCIPLES OF TEACHING READING.

The most important principles of instruction which relate to the teacher's work in each of the three elements are the following —Natural Expression, Imitation, Correcting Errors, and application of Principles of Reading. These four principles seem to embrace the entire course of instruction, and will be found of great value in shaping the work of the class room. A few suggestions will be presented under each head.

1. *Natural Expression.*—The fundamental principle of teaching reading is that of *natural expression.* This is really the key, a golden key, to all correct and artistic delivery. The greatest fault, and one which underlies all other faults in reading, is that it is not natural, but unnatural, stilted and mechanical. It is not the simple expression of an idea or thought, but an assumed or borrowed style, sometimes in imitation of the teacher, sometimes of the pastor, and

more frequently the result of some false ideal as far removed from natural expression as it is possible to conceive.

The first and constant aim of the teacher, therefore, should be to have his pupils *read naturally*, or to *read as they talk*. If their method of talking is not as it should be, begin to reform it, and base the reading on the reformed talk. In order to teach pupils to read naturally, the old habit of unnatural reading must be broken up; and this will be found to be no easy task. Almost all of the pupils of the public school read in a stilted, mechanical style altogether different from that used in talking. In ordinary conversation many of them use a natural and pleasing style of expression; but as soon as they take a book in their hands they assume a tone and manner that if we were not familiar with it would occasion wonder or laughter. The "school room tone" heard in recitation and reading is an abomination that the teacher should suppress if he would secure any progress in good reading. This work should be begun, therefore, in the ordinary recitations. The teacher should prohibit all loud, forced and unnatural use of the voice; he should require the pupils to recite in quiet, gentle and natural conversational tones. This will be the first important step in securing natural expression in the reading class.

So important is this fundamental principle of teaching reading that I shall endeavor to enforce it by repeating it under two or three distinct statements in order to impress it more fully on the mind of the teacher. Let the teacher regard these as fundamental maxims in his work.

First. Talking is the natural expression of one's own thought; reading is the natural expression of written or printed thought. Written or printed thought should be expressed in the same way one would express it if it were his own thought used in ordinary conversation.

Second. Good conversation is thus the basis of good reading. Good reading is reading as one talks. To read well, a person should express himself just as he does in natural conversation. In teaching reading we should begin with natural conversation, and build up the art upon that basis.

Third. In order to read naturally, the pupil must make the thought of the author his own thought, and then express it just as he would if he had originated it. The reader must re-create the thought of the author and stamp it with his own personality, and then express it as if it were his own and not another's. Attain this, and you have more than half solved the problem of teaching reading; you have hold of the key which unlocks the entire subject.

2. *Imitation.* The second principle of teaching reading is that of *Imitation.* Reading is an art, and like other arts is imitative in its character, and must be taught somewhat by imitation. We learn to talk by imitating our parents and other members of the household; we learn to write by imitating written or printed forms. A singer needs to hear good singing in order to attain artistic skill in the art; and the same thing holds true with the arts of drawing, painting, sculpture, etc. So in order to learn to read well it is of great advantage to the pupil to hear good reading. Young children, especially, are imitative, and they should have good models to imitate. If the older pupils of the school were all good natural readers, it would be much easier to teach the younger pupils to read correctly.

The teacher should, therefore, sometimes read for his pupils, and require them to imitate his method of expressing a thought or sentiment. He will frequently find cases in which they can be most easily led to a correct and natural expression by having them imitate his own method of expression. This is the more apparent, from the fact that there are many things in the reading books so different from the ordinary topics of conversation, that pupils need the suggestions of the teacher's voice and manner to guide them in expressing them.

The teacher should aim to become a good reader in order that he may present a good model for his pupils to imitate. He should be especially careful to avoid all mannerisms that may vitiate their style or interfere with natural expression. His manner should be so natural that no one could perceive his own style in that of his pupils, unless it were the extreme naturalness of both. It is a serious defect in an instructor when he leaves his marks on his pupils to such an extent that you can discover the teacher in the reading of the pupil. On the other hand, a teacher whose cultured and refined expression is reflected in the conversation and reading of his pupils, is worthy of the highest commendation. Let it be remembered, also, that a teacher who reads well, and is interested in the subject, will usually have much more interest in his reading classes than one who is a poor reader. I emphasize this matter of imitation for two reasons; first, because I regard it as a correct principle, and secondly, because it is

not only ignored, but actually condemned by some teachers of elocution. This I think is on account of its frequent abuse and misapplication by thoughtless or ignorant teachers. It is not the abuse but the intelligent use of the principle that I advocate; and I urge teachers as a primary condition of successful instruction in the art, to endeavor to become good readers themselves.

3. *Correcting Errors.*—A third principle that the teacher should employ in his instructions is that of *correcting the errors* of his pupils. He must not only rely on natural expression and imitation, but he must carefully notice the errors of his pupils, and endeavor to correct them. These errors will be both general and personal, and both are to be observed and corrected. All violations of natural expression are to be criticised, and individual idiosyncrasies of voice or manner are to be eradicated as far as possible. This is a point of great importance in teaching any art. How often a public speaker might have improved his delivery if some judicious friend of good taste had called his attention to some personal habit of which he was entirely unconscious, and which not only marred his speaking but detracted from his influence.

In correcting errors it will not be sufficient merely to call attention to mistakes and faults; but the pupils will need to be trained in their correction until the old habit is overcome and a new one substituted in its place. This will often be found tedious and perplexing; but it is only by constant and persistent drill that the force of habit can be overcome, and the voice and manner be trained to new and artistic forms of expression.

It will be well, sometimes, to *imitate the mistake* of the pupil, that he may see more clearly just what the defect is, and, appreciating its gravity, be ready to try to avoid or correct it. This, of course, must be done in a kindly spirit, and with the manifest desire of the pupil's improvement rather than his mortification. Sometimes other pupils may be called on to imitate or criticise the error when it can be done without giving offence or wounding the feelings. If the defect arises from the neglect of any of the conditions presented under the three elements, as will be seen in what follows, it can be corrected by calling attention to the proper condition.

4. *Principles.*—There are certain general *principles of elocution* that may be used with advantage in giving instruction in the art of reading. By a principle is here meant some general law which shows the relation of expression to the thought or sentiment expressed. These principles are quite different from the so-called "rules of reading." No one can learn to read by rule, and the attempt to teach a pupil to read by rule is deserving of all the criticism which it has received. A principle is much more general and flexible than a rule, and, while indicating the expression, allows the reader to exercise his own taste and judgment in its application. In a higher course of instruction in the art of delivery such principles are regarded as indispensable, and a few simple principles will be found of real value in the course in the common school, especially with the more advanced classes in reading.

All these principles are based upon, and express the natural relation, between sentiment and the mode of expressing it. These may be stated with such simplicity that they will be readily understood and applied by the pupil. Thus, there will be seen that there is a natural relation between the amount of voice, called *force*, and the sentiment to be expressed; and principles similar to the following will be readily understood and applied.

1. The standard force is determined by the general nature of the sentiment.

2. Unemotional sentiment requires moderate force.

3. Bold, noble, dignified sentiment requires loud force.

4. Grave, subdued, pathetic sentiment requires soft force.

A few such simple principles will lead the pupils to the idea that the method of expression should be determined by the nature of the sentiment; and they will tend to create thoughtful, intelligent, and natural readers and speakers. We commend, therefore, to teachers of reading the use of a few general principles of reading, simply and concisely stated, to aid in giving instruction in this beautiful and interesting art.

To recapitulate what has been said, it is suggested that in teaching reading in our public schools the teacher should depend mainly on four things, viz.: Natural Expression, Imitation, Correcting Errors, and Principles of Reading. The judicious use of these four principles of instruction will add much interest to his work, and contribute largely to its success.

In this article I have shown the *three elements* embraced in the art of reading and the *principles* that should guide the teacher in his instruction; in the following article I shall indicate the use of the Mental Element in reading, and the teacher's work in relation to this element.

A FABLE AND A MORAL.

THERE are many advantages in the life of a teacher, though most of us undoubtedly find many moments when the disadvantage seems fair to overbalance them. The critical mind, the observant eye, and the sensitive ear which the profession develops, come to be abnormally and painfully acute, and, besides being a source of pain to their possessors, often lay her open to the charge of carping and fault-finding. Moreover, it is necessarily the most ardent and devoted teachers who are most liable to these charges, because it is they who, "running with patience the race set before them," are apt to concentrate all their energies on their work. In succeeding in their special line of labor, they must, like all other specialists, grow more and more one-sided. This is the inevitable result of civilization, and its product and result, division of labor. "The individual withers and the world is more and more." The only consolation possible for the individual, when he mourns over the result, lies in a closer identification of himself with the great whole world, which is really "more and more" through his efforts, provided they are honest and true.

It is possible that among the disadvantages of our less professsional life may be reckoned a growing inability to find any enjoyment in the sayings and doings of precocious children. Others may laugh, but to us the exhibition is only sad, because from our habitual mental standpoint we are always seeing the end to which all these things lead, and the want of foresight which permits them. Every child becomes to us a serious problem. No child can possibly appear to us as a toy to produce amusement. That these children who are exhibited, and who amuse so much, are other people's children and not our own, is a fact which does not help us in the least. Our whole lives are spent in watching over "other people's children," and finally we arrive at the point when the sense of responsibility never leaves us. We may still retain enough self-possession and self-control — qualities which, by the way, are fortunately also strengthened by our daily life—to prevent no favor, interference, or suggestion, but there is no fun for us in the sayings and doings of the children which serve to give other people entertainment.

In the same way, when we hear a story, it is at once mechanically tested by our consciousness as to whether it will serve as an illustration for our classes, be useful "to point a moral" when other means are vain, or to "adorn a tale" when a little respite is necessary to set a fresh breeze blowing for a moment, and ventilate the mental atmosphere of some *future* recitation. Or it may be that the anecdote serves as a moral for us teachers, and gives our already freighted sense of responsibilily an additional load. It must not be forgotten that our profession has sharpened also our powers of illustration, and shown us resemblances and relations where they would seem most unlikely to exist. Therefore, the story which might seem to another to have no possible bearing upon our work seems to us to be very nearly related to it. The truth is, that after many years of active teaching everything seems to be connected in the closest manner with the daily problems of the school-room. There comes to us no near and no far, no great and no small, for there is no fact which can not be turned at once to account in our work. Here is a story which served to entertain a "piazzaful" of people this summer for a moment, was laughed at and forgotten, but my unfortunate teacher's memory has kept it haunting me ever since, and I give it now to test its power with other teachers:

There was once a man who resolved to go around the world. But it never occurred to him that there was any other way of doing this than by a straight line on a parallel of latitute. Even an isothermal line would not do for him, though that might possibly have saved his encumbering himself with overcoats and linen dusters. Accordingly he went around the world as he had planned. It is true he met with some unpleasant adventures, which caused detentions. For instance, on his first starting out, he was arrested as a burglar when found walking across the roof of the houses on the opposite side of the street, and several times he was committed for assault and battery, owing to his having knocked people down on the road. But he accomplished his feat and returned home, entering his kitchen, by means of an axe, exactly opposite the door by which he had left it years previously. His admiring friends tendered him a reception on his return, and after his perseverance, unflinching energy, pluck, and originality had been applauded to the echo, he was requested to tell them something of his travels and the countries through which he had passed. It then was discovered that he had been so intent upon carrying out his plan and not deviating from his proposed line of march, that he had not seen one single thing.

Ever since then I have been wondering, not exactly like Longfellow,

> "How many hundreds of care-encumbered men,
> Each bearing his burden of sorrow, have crossed the bridge since then?"

but how many teachers, and how many chil-

dren under the guidance of these teachers, have been and are doing precisely the same thing, not even with the omission of the complimentary reception and the congratulatory speeches at the end of the course.

PHYSIOLOGY AND HYGIENE.

BY ALICE M. GUERNSEY.

THE phrase "physiology and hygiene, with special reference to the effects on the human system of alcoholic drinks, stimulants and narcotics," is a familiar one to many teachers in our land, since it outlines for them, in fourteen States of the Union, a line of work which is often a "new departure." In most high schools, and occasionally in the upper classes of grammar schools, physiology has been taught to a greater or less extent; but until lately few superintendents or teachers have introduced it into the lower grades, or realized that in its use they had a powerful weapon against superstition, folly, and crime.

Experience proves that it is an easy matter to interest or instruct even the "wee folk" in the growth and care of their own active little bodies, and that the science is capable of perfect gradation; the tiny toddler in the kindergarten can learn that he possesses bones which increase in size because of the food he eats, and the knowledge of the four-year-old who chatters about his food getting into "my stomach and way down to my toes," is, when properly taught, as scientific, so far as it goes, as his knowledge that "one block and one block make two blocks." The intricacies of digestion, absorption, and assimilation, belong to a later stage of study; but they are as logically dependent upon the first principles as are trigonometry and the calculus upon the addition table. Add to this the fact that in Massachusetts, for example, 95 per cent. of the children never enter the high school, and 50 per cent. do not go beyond the primary school, and the value to the homes and civilization of the future, of teaching this subject in the lower grades, becomes self-evident.

THE NERVOUS SYSTEM.

"Fold your arms in front. Clasp them on top of your head. Stand erect. Take one step forward."+

"How did you know what to do?" ("You told us.")

"You may each do something that I do not tell you to do." (Question as to the acts performed, requiring such answers as, "I wrote on the blackboard." "I shut my eyes." "I closed my hand.")

"How did you know what to do this time?" (Quite likely the answer, "My brain told me," will be given. Others may say, "I told myself.")

If no satisfactory answer is obtained, develop the idea of the brain negatively. Nearly all children have seen persons who had lost a finger, an arm, or a leg, and are aware that the thinking-power is not destroyed by such accidents. Similar questions will fix upon the head as the seat of the mind. The term "brain" may then be given, and its appearance described. Let each child feel, under its coverings of hair and skin, the skull or bony case of the brain. Describe the soft, delicate structure of this organ, and its membranes. Give to each the meat of one-half of an English walnut, as an illustration of the brain-convolutions. The ultimate disposal of said meats will readily suggest itself. Show also a piece of brain-coral to illustrate the same point.

"You may each do something with your feet or your hands." "But your feet and hands are a long distance from your brain. How did they know what to do?" (If the children can give no satisfactory answer to this question, show how we communicate our wishes within limited distances by speaking or gestures; at greater distances, by letter, the telephone, and telegraph. The latter, being voiceless, is the best illustration of the nervous system. Give the term "nerves," and make sure that the children have a definite idea of them as white, "shiny" cords of various sizes, some being too small to be seen by the unaided eye. The nervous force is so wonderful, so unexplainable, that children are inclined to think of the nerves themselves as intangible and mysterious. I remember well the peculiar feelings which came over me when I first saw a nerve, as the dentist removed a dead fragment of one from the cavity of a tooth. Only since then have nerves been to me anything more than sensations.)

"Suppose you are very sick, and your father is away. What would your mother be likely to do?" (Obtain the answer, "She will telegraph for him to come home.")

"Well, he knows how anxious she is, and so he telegraphs back, "Coming on next train."

"How many messages have been sent on the telegraph wire? In how many directions?" + (Illustrate by other incidents of message and reply.)

"Shut your eyes and hold out your right hands." (Touch the outstretched hands.) "Did anything happen?" "What?" "How did you know that something touched your hand?" "Suppose you had wooden arms, like Mr. B———; could you feel a touch on the wooden hand?" + "Where did the message start?" "Which way did it go?" + (Give the name "nerves of feeling" to the kind thus found, and dwell on the point until it is perfectly clear in the child's mind. In a similar way, illustrate the "nerves of motion," and the united action of these two sets of nerves, using the experiments so familiar to the child, of the finger against a hot stove or pinched in a door, of a fly lighting on his forehead or a bee on his foot, etc. Guard against the conclusion that the nerves are only in hands. Give full play to the wonder of the child at the almost instantaneous transmission of messages. Illustrate also, but very simply, the action of the nerves of sight, affected by light only; of hearing, by sound only; of taste, by substances held inthe mouth; and of smell, by odorous substances. With young children, each of these special senses is enough for a complete lesson.)

SLATE WORK.

1. Write the messages that are sent to and from the brain when your finger touches a hot stove; when a mosquito lights on your face; when some one calls you; when the sunlight is so bright that it hurts your eyes; when you try to see in a dark room.

2. Write on your slates, *Alcohol is a poison.* Under this write the names of all drinks that you know which contain alcohol.

3. What poisonous drink is made from grapes? currants? elderberries? apples? barley? corn?

4. What kinds of food that are healthful and pleasant, are made from grapes? currants? apples? barley? corn?

American Teacher.

TAKE joy home.
And make a place in thy great heart for her,
And give her time to grow, and cherish her;
Then will she come and oft will sing to thee,
When thou art working in the furrows; ay,
Or weeding in the sacred hour of dawn.
It is a comely fashion to be glad:
Joy is the grace we say to God.

There is a rest remaining. Hast thou sinned?
There is a sacrifice. Lift up thy head;
The lovely world and the over-world alike
Ring with a song eterne, a happy rede:
"Thy Father loves thee." —*Jean Ingelow.*

HINTS FOR DISTRICT SCHOOL.

BY EVELYN S. FOSTER.

IF it is necessary to find pleasant and improving occupations for the little ones in the graded schools, it is certainly even more important in the district schools, where the many studies of the older pupils take so much of the teacher's time and attention. I once met a lady who said the ages of her pupils ranged from four to eighteen years, and the branches she taught included the primer and algebra and all the intermediate studies. In such cases, the teachers cannot give much time to the little ones who are just beginning their school life. What, then, shall she give them to keep them happy and quiet and profitably employed? I once, for a few months, taught a district school, that perhaps afforded even more variety in the way of age and studies than the average district school. Visitors often remarked on the happy faces of my little ones. I wish some of the devices I employed might help some sister teacher in a similar position.

A box of letters, originally designed for playing the game called "Word-making and Word-taking," gave my children much pleasure. I often divided the letters among them, and each child tried to surpass the rest in the number of words he could make. I distributed these letters, at recess in the afternoon, to the children who had been good during the day, so by them the little ones were allured into good conduct, both before and after receiving them. The pupils placed the words they formed upon their slates, and if a slate was shown to a chance visitor, how proud the owner felt! One boy once surprised me by forming fifteen words and using nearly all the letters given him. The little ones enjoyed this work so well that those older begged for the same pleasure. I occasionally granted it to them as a reward for a good recitation in a difficult lesson.

The box of letters was not only useful in teaching the little ones to spell, but also in teaching them the first lessons in arithmetic. By their aid the children formed the multiplication-tables. An ingenious teacher will find many ways to use them beside those I have mentioned. I sometimes secured a good recitation from my older pupils by offering as a reward to those who did well, the pleasure of teaching the little ones in the entry for a half-hour. I had one pupil who was fourteen years old. She was a good girl and did well in several studies, but was very backward in arithmetic. I soon found

that to her even "Multiplication was a vexation." Remembering that some one has said, "We never know anything until we have taught it," I asked her, when she won the reward, to drill the little ones in the multiplication-tables. Another, who was weak in spelling, sometimes taught that lesson to the lower classes. In this way the older pupils helped themselves and me also.

A teacher beginning her work in a district school often finds the pupils deficient on the ground they have already been over. If she puts them back she disheartens them, and very likely incurs the ill-will of the parents, which evils it is for her interest to avoid. I overcame the difficulty in this way. I gave my first class in arithmetic, who were studying percentage, an advance lesson, and offered them extra merits if they would recite also, for review, in the class studying long division. That class in turn, for review, took examples with those beginning addition. I followed a similar course in reading. I did not make these reviews compulsory, but tried to make them appear to the children, what they really were, a privilege. They became very popular, made the classes larger and more interesting, and afforded a healthful stimulus to both younger and older pupils.

Of course, I allowed my little ones, at times, to write upon the board, and as a reward for good lessons or good conduct would occasionally allow them to use the colored chalk. Those who do not know how happy a little thing can make a child, would be surprised to see the power that lies in even a small piece of colored chalk. When the children wrote upon their slates for busy work, I sometimes told them to write all the words they could think of containing three letters; on another day, those containing four; and so on, as "they grew in knowledge." For this suggestion I am indebted to a friend. One class worked for several days, in the time they could spare from their regular lessons, in writing a list of things decorated with imitations of flowers. Another class was very greatly interested in finding the names of things made from iron; and another, those made from wood. Both enjoyed making a list of the names of musical instruments.

Sometimes, when there was a little restlessness in the room, I secured a pleasant calm by saying: "Now we will have ten minutes of hard study; let the room be perfectly still, and I will tell you when each minute has passed. Let me see how many can keep their eyes on their books all the time." My pupils have enjoyed these quiet moments. Perhaps in some schools five minutes would be better than ten. In others, possibly fifteen would not be too long. In both a graded and a district school, it often rests the children, and helps them to be quiet to study, standing, for five or ten minutes. *American Teacher.*

THE YOUNG TEACHER.

BY ANNA C. BRACKETT.

IT is certainly true that "the laborer is worthy of his hire," if by this we mean that he ought to be paid a fair amount for his service. The double meaning of the word "worthy," however, leads us to remark, by way of parenthesis, that in school teaching the laborer is too often not worthy of his hire in the sense that he does not render a fair equivalent for the money paid him.

It is very true that if the teacher is a good one, he deserves to be well paid, though in that case no money can be any equivalent for his services. We might as well talk of recompensing our parents or our friends with money, as of squaring our account with the real teacher. It is impossible.

We can pay for sugar and calico, and for the carpenter's and mason's work, and remain under no obligations to those who exchange these things for our money. But personal influence on character, and life, and thought, are things for which we cannot pay in minted coin, and we must always be under a deep sense of obligation to those teachers who have given us these.

However, if the teacher's work is well done, he has a right to expect and demand sufficient salary to enable him to live comfortably and to lay up something for the years when active toil shall be impossible.

But too many young and inexperienced teacher make the mistake of supposing that a large salary is to be the equivalent of their services at the outset of their career.

The one need of the young teacher—of the graduate of the normal school—is not salary but experience, and though he must have some salary to enable him to live, it is not after that that he ought principally to look. It is true that he has spent some time in endeavoring to fit himself for the work. It is true that there may be others whom he wants to help. But after all, we do not know yet, and he does not know yet, that he is a teacher at all, or that his services in

that capacity will be worth any salary. That still remains to be proved, and very thankful ought he or she to be for the opportunity to prove this. If any town or district will give him the use of a well-furnished room and school apparatus free of cost to him, and then trust its children to him to experiment on, it would seem almost as if he ought to pay money to that town or district for the privilege.

Because a young man or young woman is a graduate of a college, it by no means follows that we are to have a good teacher. But the majority of college graduates seem to have no doubt whatever on this subject. They write in this wise: "I expect to graduate from ——— college next June, and would like a position in one of your schools." It is surprising if they do not add that they "can teach anything usually taught in schools."

Of two things we may be reasonably sure: (1) They do not intend to lend their service except at a high salary. (2) They do not know the meaning of their own words.

To one who has, by years of constant practice and through many mistakes, arrived at any conception of what the work is which they so unhesitatingly approach, it would seem as if, instead of the usual formulæ, we ought to receive applications somewhat in this strain:

"I expect to graduate from ——— college in June. Would it be possible for me to enter your school as an observer and student for two or three months, and afterwards be entrusted with some few classes, that I may learn whether or no I have the requisite gifts for the position of a teacher?"

As I write this fanciful note, the incongruity of its spirit with that of the confident spirit of many college and normal school graduates strikes me as almost ludicrous. And yet the application is in the true spirit of the true teacher.

I remember once hearing of a poor sick woman who was so overwhelmed with delight at something that was done for her that she exclaimed:

"What! all this and heaven, too?"

In the same spirit does the true aspirant for a teacher exclaim, after going through her first summer term, thinking only of her work, when the committee man brings her probably the first money she has ever earned, as her promised salary, exclaim, mentally at any rate:

"What! all this experience and money, too!"

My readers may smile, but this is the spirt of a true teacher, and this feeling ought to be so general that it would seem only the most natural and probable thing in the world.

American Journal of Education.

EDUCATIONAL TRAINING.*

BY WM. HENRY RAWLE, LL.D.

THE seductive doctrine that a college education is largely useless because it teaches useless things which after-life is taken up in forgetting, fails to grasp the chief object of study. For many purposes, it is, of itself, a matter of no consequence that the three angles of a triangle equal two right angles, or that the battle of Salamis was fought B. C. 480, and he whose knowledge consists largely in piling together such propositions or facts cannot be called educated. Any one may get through his classics using a crib instead of his grammar and dictionary; he may perhaps even get through with credit; he may cram for his examinations and be glib at functions and quaternions; but what he thus learns will take no hold upon him, and like money easily got, it easily goes. It is the mental discipline acquired in the course of certain studies which produces what is known as the trained mind—which toughens the mental fibre, which develops concentration of thought into intellectual habit, and enables a man in after-life to do his work, of whatever kind, more easily, more thoroughly, and with less mental strain and friction. This can hardly be overstated. Of course there are men who go to the front without it, but the extent to which they themselves prize this higher education, is made known to the world by the colleges throughout our country which some of these very men have founded and endowed. There are those of us to whom it would be a disgrace not to have acquitted ourselves fairly in life. With every advantage of education, of position, of at least an even start in the race, it but needs that we should learn what we *can* do, and still better what we *cannot* do, to win at least something of what the world calls success. But a more interesting lesson is taught by the early days of many of those who bear the proud title of self-made men; whose hours, after keeping the store or teaching the school is over, are given to self-teaching

* Extracts from an address delivered June 25, 1885, at Cambridge, Mass., before the Harvard chapter of the Phi Beta Kappa Society, on "The case of the educated unemployed."

—who, with the conviction that "knowledge is power," to this end deny themselves the pleasures and even the necessaries of life. It may be that the mental discipline which such as these undergo tends to self-knowledge. It is the best knowledge that can come to us, and it is, of all other knowledge, that which is the least sought after. Few attain such knowledge very early in life—many never attain it at all—and though it may be that taking thought will not add one cubit to the stature, it will at least enable one to know whether he be tall or short. Self-knowledge may not give brains where God has denied them, but it will at least teach us whether they have been given or denied.

But self-knowledge, like other knowledge, comes to us better and more quickly by being skilfully taught, than when we teach it to ourselves. One may become a fine chess player and yet never have looked at a "book opening," but he will have wasted much time and labor in teaching himself what he could easily have learned from the work of others who had gone before him.

A cobbler may not go beyond his last, and I hardly venture to speak with any confidence in this regard as to the other professions. That of the ministry is exceptional in this country, and there have been few inducements to tempt laborers into the vineyard. But it is believed to be true that the demand for the best ability exceeds the supply, and that a vacant pulpit of a high order is filled with difficulty, and often by importation from Great Britain or her colonies. In medicine, apart from the usual ills that flesh is heir to, modern modes of life and work in our trying climate have produced complications, mental and physical, which tax the highest professional skill, and such skill in the various branches of the profession is more in demand and more highly paid than ever before. Naturally the need for young men to assist in the work is also great, and we see a certain class of these rising to assured success with a rapidity unknown in the last generation.

If it be asked how far is all this consistent with the professions being overcrowded, and with there being thousands who are doing absolutely nothing, the answer is that for *those* thousands there is no place in the professions. There, the race is now to the swift, and the battle to the strong. As turfmen say, "it is the pace that kills," and the pace to-day is so fast that all but a few are distanced. It is literally the survival of the fittest.

This may sound hard and cruel—it may have too much of the cry of *Væ victis*—but I believe it to be true, and perhaps it is better for the world that it should be true.

The fact is that the overstocking of the professions is but the outcome of what has been going on for more than a generation. As in an army those who command are few, and those who are commanded are the many and do the work, so in a community, the vast majority should be those who contribute to the material gain—putting it broadly, those who work with their hands rather than with their brains. But until very lately, although one heard much of the dignity of labor, it was a dignity which too many were willing to forego, and the only implement of labor which these considered proper for their hands was a pen. Their fathers did not all share this feeling. In the last generation certain pursuits began with work that is now unknown; he who entered a counting-house went there early in the morning, took down the shutters, swept the floor and lighted the fires. A student in a lawyer's office not only copied the pleadings, but all other papers, carried notes, went to bank, and did generally what was asked of him. But the sons of that generation have considered not only that customs have changed, but that work done by men's hands, no matter what, is derogatory. Hence, employment even as a clerk has been as much desired as any less elegant occupation has been scorned. Of course the supply soon exceeded the demand, and the unemployed crowd, educated and uneducated, is absurdly large in proportion to the community and its wants.

The reaction seems to have set in. Some young men of the present day have, it would seem, a future before them which was denied to their elders or was undreamed of by them. Many of them seem now to feel that no work can come amiss to them for which their abilities are fitted—that no life can be too hard, no privation too great, which leads to their development. It is significant—and not as matter of regret but rather as matter of pride—that graduates of our universities are found in the machine shops of our great corporations, wearing grease-proof overalls and earning five cents an hour for a working day of eight to ten hours, out of which they pay their board. Of course, these see their future; they have measured their own capacity and foresee their ultimate promotion, though there is none for the first years. It is also significant that schools for mechanical instruction are springing up all over

the country, and that some of our colleges have themselves introduced it among their branches.

Of course, one does not mean that our college graduates are to support themselves through life by manual labor—to be blacksmiths or brakemen or chain carriers—any more than the cadet at West Point who learns to clean his musket and his boots expects to be a private soldier or an officer's servant. There are brakemen who never get to be more, and there are soldiers who never attain the rank of a corporal. But here is where the education comes in, and the mechanical instruction and practical knowledge, based as they are on college training, are, as the mathematician would say, raised by it to a higher power. There is nothing in life which a man may do, no matter who he is or what it is he does, that he will not do better with the help of training. The extent to which the world is suffering from want of the highest education applied to its modern needs suggests lines of painful thought. Those who have been accustomed to sneer at the Baconian philosophy, and to think, as did Seneca and those of his school, that the well-being of mankind was beneath the attention of a philosopher, have had forced upon them the fact that with all the growth of civilization and wealth and taste and luxury, we are, as to many things, absolutely without knowledge. There is not a man in the world to-day who can build a cathedral, and Westminster Abbey and Notre Dame stand as monuments of what has never been done since the days when scarcely a man outside a monastery could read or write. The story told by the aqueducts built thousands of years ago contrasts strangely with those we hear to-day of towns whose polluted water has filled their hospitals with the dead and dying. Either it is true that scarcely a man in the world knows how to drain and pave a city, or else such knowledge is so limited that its possessor is like one crying in the wilderness. Either there are few who knew how to build a house, or the many are so perverse that they refuse to have it built according to certain scientific, climatic and hygienic principles. Either there are few who can give competent judgment as to the probable future of a mine, or the many choose to employ less instructed men and lose their capital accordingly. One has but to mention such sciences as Chemistry, Geology, Engineering in all its branches, to suggest the future that therein lies to him who shall more completely give to the world their secrets. And no education can be too complete which may help to develop the practical results from the knowledge which, within this generation has come to us, that Light, Heat and Electricity are one Force with various manifestations.

Nor only this. Apart from education and mental discipline and all that comes therefrom, there is the fact that college life presents the only largely organized American existence in which play as well as work is now looked upon as a reasonable part of life. For love of play is as needful to be taught as love of work. It may be that colleges destroy some young men, but the percentage is very small; and whatever be the risks, they are invaluable if only to teach the healthy joy of play, of games, of use of the physical frame. After-life here in our serious race more or less discourages these.

We all know successful men of business who insist that in their form of career, the four years of college would be lost years. The reply is that what the average American business man lacks is capacity for mental, indeed for any amusement. In this direction the refining influence of four college years is beyond words. Physicians will tell us that they see every month overworked, broken-down men who need rest but cannot enjoy it, because although disease has made a vacuity of pursuit, there is nothing to fill the abhorred vacuum. They neither ride, nor shoot, nor fish, nor read in a true sense. They are like a slave who has found a great jewel. They have got the longed-for diamond of leisure, and know not how to wear it, and cannot sell it. They are forbidden to work, and no man ever taught them play of body or mind. They have won the battle of life as they intended to fight it, and the victory is like those of Pyrrhus, That inexorable creditor, Nature, is at their door and cries, "Pay me that thou owest." And they have not wherewithal to pay.

So much for college education from the hard, practical, material point of view. Even a Gradgrind must be satisfied with the picture. But if we pass from what strictly pertains to success in life to higher influences, we enter a region in which we cannot expect Gradgrind to follow us. Love of study for its own sake, shared by the sympathy of others, fostered by congenial surroundings and the interchange of thought, incited by emulation, humanizes our coarser nature, broadens our range of thought, opens to us wider views of life. By it, too,

are created friendships which are not of to-day or to-morrow, nor yet of this world. Leaders of modern critical thought have branded Macaulay as a Philistine, yet surely it was no Philistine who, speaking of "the feeling which a man of liberal education naturally entertains towards the great minds of former ages," said, in words which even you can bear to hear repeated, "The debt which he owes to them is incalculable. They have guided him to truth. They have filled his mind with noble and graceful images. They have stood by him in all vicissitudes—comforters in sorrow, nurses in sickness, companions in solitude. These friendships are exposed to no danger from the occurrences by which other attachments are weakened or dissolved. Time glides by; fortune is inconstant; tempers are soured; bonds which seemed indissoluble are daily sundered by interests, by emulation, or by caprice. But no such cause can affect the silent concourse which we hold with the highest of human intellects. That placid intercourse is disturbed by no jealousies or resentments. These are the old friends who are never seen with new faces; who are the same in wealth and poverty, in glory and in obscurity. With the dead there is no rivalry. In the dead there is no change."

It may well be that much of this is little felt in the heyday of life and while one is pressing on in the race to the front; but life is not all made up of health, of strife, of victory, and at every interval of enforced inaction, and still more when the lengthening shadows of age stretch along our path, then these friends come to us, as it were from a far country, and bring us that peace which the world cannot give.

IRREGULAR ATTENDANCE.

1. An hour lost is lost forever. Present duties crowd the present, and the past cannot be recalled.

2. One lesson depends on another. Every unlearned lesson weakens the foundation on which others rest.

3. Irregularity in boys becomes the same in men. A bad habit stays by us.

4. The teacher's explanations to the class are important; and there is no time for repetition.

5. It checks the progress and enthusiasm of the class, and wears upon the nervous system of the teacher.

6. The reputation of the school and teacher suffers.

7. If a pupil loses his interest for school-work, outside matters fill his mind.

8. It causes disturbance for the pupil to find out the lessons of to-day.

9. One day out of school results in unlearned lessons, and the consequent loss of the next.

10. The teacher cannot be interested in those who show no interest in the school.

ONE WAY TO TEACH BOYS.

BY REV. EDWARD THRING.

MANY years ago, one spring morning, in the pleasant southern shire, when the sun shone out on the happy fields and touched with loving care the gables of my home, well do I remember how I saw, through a film of tears, a little chimney-sweep coming up the road leading to the house, and envied him with passionate envy; for he might stay — he had not to go to school, as I had to do—he was not banished. But I had to go. It is easy to laugh at a child's sorrows, but they are very real. That morning, more than fifty years ago, though many a bitter day and fierce, hard year has been faded since, still lives in memory as full of pain; that hour holds its own as not the least wretched of unhappy times. And, indeed, in the little bounded world of the child's life there was only too much cause for the feeling; very real grounds for that emptiness of heart. School meant nothing less than light-hearted liberty gone, and a prison in exchange; where every joy, which at that time was joy, was shut out; a prison full of blind fears, daily task-work, sharp and constant checks, accompanied by absolute ignorance of the why and the wherefore. From beginning to end the whole thing was a painful puzzle, a riddle without an answer. The envy of the chimney-sweep has not passed away out of the boy world, though most boys pitch their ambition somewhat higher in these days. Most assuredly the aimless riddle is as obtrusive and unanswerable as ever; but it is every day answered in boy fashion, by idleness, folly, and vice. Give it an answer. The question of value is a very serious one. The boy's mind must be got at somehow or other.

That is the first thing. The teacher ought to be perfectly master of the whole question, and not merely in a vague way deal in general terms, and *ipse dixits:* if, indeed, under the circumstances, it ever crosses his mind to say anything at all to the

boys on the subject. But he ought especially, and before all things, to have some of the elementary truths about the work at his finger-ends; and be able to drill a hole in a dull mind by a sharp, quick question, "why he is not hoeing turnips, or bird-keeping, earning 3s. 6d. a week, instead of wasting life and money in school?" And he ought to be able to answer his own question, and send a ray of light in through the hole he has drilled; or rather pull the answer out of the boy himself, by a little dexterous manipulation. There are many common facts all around of this kind, which are startling enough when attention is drawn to their real significance.

The boys of a class were once not a little discomfited and amused by something like the following dialogue:

Master.—Did you ever hear of Fortuna's purse?

Boys (*two or three*).—Oh, yes, it always had money in it.

M.—Why don't you get one?

B.—Oh, it's only a fairy-story; don't I wish I could?

M.—What! you don't mean to say that you don't believe it?

B.—Of course not. Who believes in fairy stories?

M.—I do. Really, now, don't you know where the purse hangs?

B. (*quite puzzled*).—No.

M.—Fairy-purses hang on the fairy-tree, to be sure; I have one.

B (*incredulous*).—You don't say so.

M.—But I do (pulling out a shilling); that came from it.

B. (*very much taken aback*).—Are you serious?

M.—Quite serious. Where did this shilling come from?

B.—Oh, it's yours.

M.—No doubt. I did not steal it, I hope; but how did it become mine?

B.—Oh, I suppose you were paid for keeping school.

M.—Well, why don't you keep school? You told me you would like some money.

B.—I don't know enough.

M.—Oh! but what has that to do with it?

B.—Of course you must have knowledge to keep a school.

M.—Indeed! do you mean to tell me that my knowledge turned into money?

B.—Yes.

M.—What? This shilling part of a Greek verb?

B. (*laughing*).—I suppose so.

M.—What are you, pray, doing here?

B.—Oh, we come to learn.

M.—Not to get knowledge, surely?

B.—Of course we do, though.

M.—You don't mean to say you are climbing the tree of knowledge?

B. (*twinkling somewhat*). Well, I suppose so.

M.—To go back; where does the fairy-tree grow?

B. (*promptly*).—In fairy-land, to be sure.

M.—You forget. I said I had climbed it.

B. (*dubiously*).—Yes, I remember. Is it the tree of knowledge?

M.—Where did my shilling come from?

B.—From the knowledge you have.

M.—But where does the fairy-purse hang?

B.—You told me on the fairy-tree.

M.—But the shilling came from the fairy purse.

B.—O-o-h-h!

M.—And you agreed that the fairy-purse hangs on the fairy-tree. Now, what is the fairy-tree?

B.—It is the tree of knowledge.

M.—And you told me that the fairy-tree, *of course*, grew—in?

B.—O-o-h-h! fairy-land.

M.—And fairy-land is?

B. (*many broad grins*).—School.

No pantomime ever made a more unexpected transformation scene than this, when the whole class with a delighted chuckle, perceived that they had been trapped into calling school, fairy-land. For a time, at least, they did not envy the chimney-sweep.

SIX KINDS OF MANNERS.

BOY'S LECTURE TO BOYS AND GIRLS.

"LADIES and Gentlemen, manner means way, and a manner is a way, and manners mean ways. The ways you do things are your manners. The ways you look, the ways you speak, the ways you act, the ways you move, the ways you eat, are your manners. What you do with your hat is a part of your manners. I do not mean hanging it up; I mean taking it off or keeping it on. Everybody has to have some kind of manners, because everybody has to have some kind of ways to do things. There are two kinds of manners—I will mention them—good ones and bad ones. Your face looks better when you are having good manners than it looks when you are having bad ones. I have heard of six kinds of bad manners, and one more. I will mention them. Pig manners, one; bear manners, two; donkey manners, three; cock-a-doodle-doo manners, four; post manners, five; cow-in-the-parlor manners, six.

"First, Pig manners; and if you want to know what they are, go look in the pigs' pen when their dinner is being put into their trough. Every piggy hurries to get the most, and get the best. Every piggy looks out for itself, and does not care for the other ones. Children that have pig manners are the kind that want to be helped first at meal times, and want the best things

for themselves, and the biggest pieces. They look out for themselves and do not care about other people getting anything good.

"Second, Bear manners. Children that have bear manners are the kind that are gruff, and grum, and growly. They have cross-looking faces and sometimes stick their lips out, and snarl, and growl, and are always grumbling and growling about something they want to do or they don't want to do. They talk in this way: 'Find my hat!' 'I want to go out!' 'Open the door!' 'I want something to eat!' and never think of a 'please' or a 'thank you,' and they get cross very often, and look cross.

"Third, Donkey manners. Children that have donkey manners are the kind that want to do just what they want to do and nothing else, no matter how much you may ask them and coax them. If you ask them to move, they stay still. If you ask them to stay still, they move. If you ask them to keep quiet, they make a noise. If you ask them to make a noise, they keep quiet. If you ask them to go on an errand, they say 'Don't want to!' or 'I aint agoing to!' and the worst say 'I will!' and 'I won't!' When they are playing, they never do what the others want to, but only what they themselves want to.

"Fourth, Post manners. Children that have post manners are the kind that do not answer when they are spoken to, any more than a post would. If a visitor says, 'How do you do?' or 'Do you like to play tag?' or 'Do you like pictures?' or butterflies, or anything, they stand still as a post, and do not speak; but maybe if you should ask them if they liked candy, they would speak one word, and I guess it would be yes, unless he nodded his head.

"Fifth, Cock-a-doodle-doo manners. The children that have cock-a-doodle-doo manners are the kind that feel big and act so. When a rooster struts around among hens he acts as if he felt so big he did not know what to do, and sometimes he seems to feel so big that he has to get up on a fence and clap his wings and crow cock-a-doodle-doo! Sometimes there'll be a lot of fellows playing, and a cock-a-doodle-doo fellow will come there, and he'll act as if he thought he knew the right way to do everything better than everybody, and he will give them the rules, and he'll strut round like a rooster, and in his house he does that same way to his mother and the other grown-up ones, and ones that are not grown up. That kind of a fellow ought to stand up on the fence and clap his wings—no, I mean his elbows—and crow 'Cock-a-doodle-doo! I know better than you!'

"Sixth, Cow-in-the-parlor manners. Children that have cow-in-the-parlor manners are the kind that are always getting in somebody's way, or pushing themselves in between people, or going in front of people, or stepping on somebody's feet or on bottoms of ladies' clothes, or leaning against people, or stumbling over things, or bumping against the furniture, or against people, or tipping over their own chairs, or knocking down a vase, or a work-basket, or a tumbler of water. They are as clumsy as a cow in a parlor, and do not mind what they are about any more than a cow in the parlor would mind what she was about.

"Besides these kinds there is another kind I heard of, called the Interrupters. Interrupters are the kind that begin to talk while other people are speaking, no matter if it is their father, or their mother, or company—the interrupters do not wait for anybody to stop talking, but break in and say what they want to.

"I suppose that a boy or girl, or any other person, might have two kinds of bad manners both at once. Some of the people in my house talked about this. My cousin said that if a boy should have pig manners and bear manners both, he would be bad to live with, and so would a girl if she should. My big brother said that if a boy should have three—pig manners, and bear manners, and donkey manners—he would want to keep him in a room by himself, and so he would a girl, if she should have them; and said that if a boy and a girl should have pig manners, and bear manners, and donkey manners, and post manners, and cock-a-doodle-doo manners, all five, he would want to chain them up in cages; and said if they should have all six kinds—pig manners, and bear manners, and donkey manners, and post manners, and cock-a-doodle-doo manners, and cow-in-the-parlor manners—and be interrupting besides, he would want to put each of them under a barrel and stop up the bungholes. I do not believe he would stop up the bungholes, for then they could not get air to breathe. My mother does not believe anybody could have so many kinds of bad manners and be alive. Once my mother went somewhere to stay, and she had to come away because the children had such manners she could not stay. They had bear manners and some of the other kinds. I think it is very hard to have good manners all the time until you get used to having them."—*Reported for Wide Awake, by Mrs. A. M. Diaz.*

BREATHING CHEMICALLY CONSIDERED.*

CLASS EXHIBITION LECTURE BY SUPT. R. M. STREETER, TITUSVILLE, PA.

LADIES AND GENTLEMEN: We are to consider this evening breathing from a chemical standpoint. Animals cannot live without air. In the lowest forms of animal life, the oyster, for example, little air is needed; but ascending the life-scale, we find the demand for it constantly increasing. The organs of the animal adapted for the reception of air, are the lungs; and it is here that the breathing is accomplished. This is made up of two distinct acts: drawing the air into the lungs, and forcing it out.

The subject resolves itself into three conditions: *What do we breathe? What, chemically, is accomplished by breathing?* and *What practical lesson does such investigation teach?* Let us now consider the first of these questions.

* This paper is designed for classes that have finished the usual chemical course in the public school. It has been used with success by such classes, as a chemical exhibition. It should be prefaced by a short address, written and spoken by a member of the class; and if the apparatus and the experiments have been prepared by the pupils, the introduction should state that fact.

No class whose chemical study has been commendable need hesitate to attempt the presentation of this work from a lack of apparatus. The average American boy has more than once proved equal to the emergency; and results are more surprising and more satisfactory, when, from apparently useless materials, a little ingenuity has fashioned a contrivance which has made the entertainment a success.

If due precaution be taken in the preparation of the gases, there is no danger of accident. Phosphorus can not be handled too carefully. The cutting should always be done under water and the part not to be used should be immediately returned to its bottle of water and the stopple put in before going on with experiment.

In giving the lecture, the three questions have been presented by three pupils, usually girls. That pupil showing the most skill in handling apparatus should have it wholly in his care. He should arrange for each experiment its own apparatus, and have the apparatus in place when the entertainment begins. His place during the lecture is at the speaker's side; and his duty is to place the apparatus for the speaker, and to have it ready for the experiment exactly on time. He should have two assistants. The first will place in his hands the apparatus needed the moment he turns for it. The second, on the other side of the speaker, removes the apparatus the moment the experiment is finished.

I. WHAT DO WE BREATHE?

Here is a substance called phosphorus, common to us in the friction match. This large cork keeps the burning phosphorus from the water. (The phosphorus is lighted and the jar put in position.) These dense white fumes are formed by the union of the phosphorus with a part of the air; and while the fumes are settling, let me take the time to explain a term which may be frequently used this evening.

When a substance can not be decomposed, chemists have agreed to call it an element; phosphorus is one of these. A peculiarity of these elements is their strong tendency to combine with one another. The moment the phosphorus blazed, it began to combine with one of the elements of the air for which it has the greatest attraction. It asked "What is meant by *attraction?*" I can show you by this magnet. When I bring one end of the bar to the needle, the needle rushes towards it; and that property of the bar to draw the needle to itself is called attraction. That attraction which the different elements have for each other is known as *chemical* affinity, and the lively combination of the phosphorus and a portion of the air is due to this affinity.

This can be beautifully illustrated. Here is a piece of potassium, which has so strong affinity for one of the elements of water as to burst into flame on combining with it. (The potassium is here dropped.)

I have here some muriatic acid and some liquid ammonia, both very strong. If I shake these bottles and expose their contents to the air, nothing perceptible occurs; but, when after shaking they are brought together, the result is seen at once. There is an affinity between the acid and the ammonia, and they unite, forming the white cloud known as sal-ammoniac.

We are now ready to go on with the examination of our jar. We are answering the question, you remember, What do we breathe?

The fumes have been absorbed by the water, and we find the jar filled with water and air in the proportion of one part of water to four of air. I said *air*. Is it? I place it beside this uncovered jar which we know is full of air. It certainly looks like it. Like pure air, it has no odor. I lower this candle into the jar of air; it burns. I place it in the other; it goes out. It is not air, that is certain. It is one of the elements of the air, and is called *Nitrogen*.

We see, then, that four-fifths of the air is nitrogen. What is the remaining one-fifth?

Here is a jar four-fifths full of nitrogen. If I put with it an element which mixing with the nitrogen will form a mixture supporting flame, we may conclude it to be the element which the phosphorus took from the air. I have here such an element, and mingling it with the nitrogen I place the lighted candle again in the jar and you see it does not go out.

Let us examine this new element. Like air, like nitrogen, it is colorless. Like them it has no odor. I lower into it this candle, having a single spark. Here is the test. It bursts into flame. The element is not nitrogen,—that does not support combustion. Neither is it air. It is *Oxygen.*

What, then, do we breathe? Air; and air, we have found, is made up of four parts of nitrogen and one part of oxygen.

I have more of this oxygen; and in the experiments which follow, one fact should be borne in mind, because upon this fact rests the whole theory of breathing: *the chemical affinity of one element for another.*

When I lower this burning candle into the nitrogen, it goes out because there is no chemical affinity between the elements of the flame and the nitrogen. When I plunge it into the oxygen you see how strong this is.

Watch the brilliant burning of this watch spring.

This bit of charcoal bark shows the same thing; and this experiment should be especially remembered, because it will be referred to by and by.

We saw a little while ago how phosphorus burned in air; see how it burns in pure oxygen.

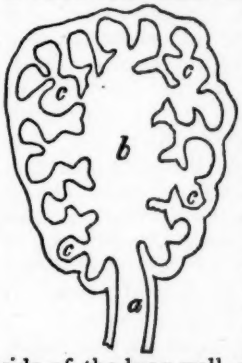
From these experiments we may conclude that pure oxygen combines with whatever element it comes into contact except pure nitrogen, with which it forms a mixture. Nitrogen, however, sluggish as it is, has an important office to perform in the physical world, and we can here state what that office is.

"Suppose," says Faraday, "we had pure oxygen as our atmosphere; what would become of us? You know very well that a piece of iron, lit in a jar, goes on burning to the end. When you see a fire in an iron grate, imagine where the grate would go to, if the whole of the atmosphere were oxygen. The grate would burn up more powerfully than the coals,—for the iron of the grate itself is even more combustible than the coals which we burn in it. A fire put into the middle of a steam engine would be a fire in a magazine of fuel, if the atmosphere were oxygen. The nitrogen lowers it down and makes it moderate and useful for us."

2.—WHAT, CHEMICALLY, IS ACCOMPLISHED BY BREATHING.

We draw the air into our lungs. What happens?

The lungs* are two large organs in the cavity of the chest, one on each side, extending from about the level of the collar bone to just below the region of the heart. They are spongy in texture, that is, they are everywhere filled with little cavities, imperfectly separated from one another by slender partitions, like the tissue of a sponge. Each one of these cavities is filled with air, and so small are they and so closely packed together, that the whole substance of the lungs is filled with small air bubbles throughout their tissue. Here is a drawing showing the part of the lung which comes in contact with the air. At *a* the air enters, at *b* is the cavity of lobe, at *c* are the air cells, the walls of which are covered with a net-work of blood vessels smaller than a hair. When we draw in the air, it is on this side of the lung-wall, while the blood is on the other. How the air and the blood come together can be best seen by an experiment.



Here is a porous cup into which this glass tube is fitted with a rubber stopper, the lower end of the tube dipping into colored water. If this bell-glass, filled with hydrogen gas be placed over this cup, the gas will find its way through the walls of the cup, and, being lighter than the air inside, forces it down through the water in bubbles.—There it comes.—Now if gas can find its way through the pores of this thick cup, it can be understood how the oxygen finds its way through the porous lung-wall which is thinner and more delicate than tissue paper.

I wish at this point to prepare for a difficulty which you may have anticipated. I have here some hydrogen and some oxygen. When these gases get together in proper proportions, a lighted match will announce the fact, if brought near enough. I have in this bottle the same quantity of each gas, and you hear the result. Here are two bottles of the same size, one filled with oxygen,

*This should be illustrated by enlarged copies of engravings from the text-book.

the other with hydrogen, and connected with each other by this tube. We will examine them later.

We left the air in the lungs. Let us follow its course. Passing through the lung-wall and mingling with the blood, it leaves the lung, passing directly to the heart, and from the heart is driven into the arteries. From the arteries it pulses into the capillaries, which are the very small blood vessels connecting the arteries and the veins. The difference between these, broadly stated, is, that the arteries carry the blood from the heart, while the veins carry it back. When the oxygen reaches the capillaries, it finds there the waste particles of the body; and "not an act can be done, a word spoken, nor a thought occur, without the destruction of some portion of these organs." This causes waste, and these waste particles or impurities are to a certain extent taken up by the blood as it travels slowly back to the heart. This waste is chiefly carbon. In the experiment of carbon with oxygen, which you were especially to remember, the carbon eagerly seized the oxygen on account of its strong affinity for it. So in the capillaries, when the oxygen with the same intensity comes in contact with the carbon, the elements combine, forming a compound known as carbonic acid gas. Flowing onward the oxygen with its carbon leaves the capillaries, enters the larger veins, goes back to the heart, thence to the lungs, and passing again through the lung-membrane, enters the wind-pipe and in the form of carbonic acid gas mingles with the air.

Here a question arises. Carbonic acid is on one side of the lung tissue, the inhaled oxygen on the other. How can they pass in opposite directions through the same substance at the same time?

These bottles will show us. In one is placed hydrogen gas, in the other, oxygen. If the hydrogen and the oxygen have mingled, touched with flame, they will explode. There! they tell their own story. Here is another experiment which comes still nearer the fact to be illustrated: A thin sheet of India-rubber is tied tightly over the mouth of this jar. The jar was then put into an atmosphere of carbonic acid. A little of the air inside has escaped, and so much of the carbonic acid gone in as to distend the rubber to its present form. Here the reverse has taken place. The carbonic acid was confined and the position of the rubber is reversed. In this way the carbonic acid and the oxygen pass the membrane of the lungs.

Is the breath from the lungs carbonic acid? Let us see.

I have here some powdered marble and some muriatic acid. The effervesence caused by combining these is due to the giving off of carbonic acid. Let us examine it. It is colorless; it has a slight pungent odor, and a sour taste. It puts out the flame of a candle.—By means of these scales you can see that it is heavier than the air.—I can pour it (it is poured upon the flame of candle placed in a glass jar); but the best test is to force it through lime water. See! the lime water is milky. The question is, however, how do we know that breath from the lungs is carbonic acid? I will force my breath through this lime water and if the water becomes a milky color, you can answer your own question.—There it is!

Well we have seen where the oxygen in this carbonic acid comes from, but where does the carbon come from? It comes from the blood; the blood is made out of the food; and food is made out of carbon, hydrogen, and oxygen. Most of the nourishment we take is made up chiefly of these. Bread, for example, is nearly four-fifths starch and sugar, and these are almost wholly carbon, hydrogen, and oxygen. Now if I can take away the hydrogen and the oxygen, the carbon will be left and I can show it to you. Here is some syrup, made of sugar and water,—better for our purpose, because in this form the action is quicker. I mix with this a little sulphuric acid, which has a strong affinity for hydrogen and oxygen, and which, removing these from the syrup will leave the carbon.—There it is, carbon or charcoal, if you choose to call it so. You have already seen, in the experiment of burning carbon in oxygen, how the two combine to make carbonic acid, and this is the answer to the second question.

3.—WHAT PRACTICAL LESSON DOES SUCH INVESTIGATION TEACH?

I have another simple experiment. Here is a jar of air. I close it, and from it, by means of this tube, the air is inhaled. By placing the jar over water the air can be drawn up into the lungs and forced again into the jar.—Inverting the vessel, and removing the cover, I lower into it this burning candle.—It has gone out. A single breath has made the air so bad that a light cannot burn in it. Now if the same breath be breathed over again, the blood receives no fresh oxygen, and the person so continuing to breathe it dies. The average amount of air consumed at every breath is thirty cubic inches;

the average number of breaths a minute is twenty; so that in twenty-four hours one person will consume five-hundred cubic feet of air. How needful it is that the air we breathe should be pure, this last experiment shows; and, better than words can tell, it illustrates the lesson which this investigation was intended to teach.

I will close by giving another beautiful illustration of the chemical affinity—the real subject this evening—which exists between chlorate of potassa, sugar, and sulphuric acid, after thanking you for your attendance and attention.

OUR SCHOOL ARBOR DAY.

FOUR THOUSAND ARBOR-DAY TREES, VINES, ETC., PLANTED IN LANCASTER.

THE observance of Arbor Day on the afternoon of October 29th, by the Lancaster High School, was appropriate to the occasion, and greatly enjoyed by the schools, members of the School Board, and others who were present. Before the close of the morning session, a choice fruit tree was given to each of the pupils in the Boys' Department, with explicit instructions as to how it should be planted. A number of the girls also planted trees. The following programme was announced for 2:30 p. m., and closed with the long-metre doxology at 4:45 p. m.:

PROGRAMME.

Reading and Prayer . . . . . *Rev. J. Max Hark.*
Song—Song of the Maple . . . . . *R. M. Streeter*
Song—Child of the Regiment . . . . . *Donizetti*
Song—It is Better to Laugh than be Sighing . . . . *Donizetti.*
Address—"A Talk about Trees" . . . . . *Simon P. Eby.*
Song—To Alexis I Send Thee . . . . . *Himmel.*
Song—The Merry Swiss Boy . . . . . *Folksong.*
Song—Over the Dark Blue Sea . . . . . *Swiss Air.*
Readings—
"The Little Tree," (*F. Rückert*)—Bertie L. Cochran.
"Apple Trees in Love," (*H. W. Beecher*)—Wm. E. Powell.
"Field Preaching," (*Phœbe Cary*)—Emily N. Thomson.
"On Forest Trees," (*W. Irving*)—Benj. B. Wolf.
Report—Arbor Day Work in the City of Lancaster—City Supt. R. K. Buehrle.
General Remarks—Dr. J. P. Wickersham, Rev. C. L. Fry, Rev. J. Max Hark, and J. P. McCaskey.
Song—Ah, So Pure! Ah, So Bright! . . . . . *Von Flotow.*
Song—Woodman, Spare That Tree. . . . . *Henry Russell.*
Doxology—"Praise God from Whom All Blessings Flow."

The Scripture reading, by Rev. Mr. Hark, was from Genesis i. 11–13, Genesis ii. 6–10, Isaiah xli. 17–20, Mark iv. 30–32, and Revelations xxii. 1–5.

The vocal music under direction of Prof. Carl Matz, was excellent, the well-trained chorus including some three hundred voices. The selections were from No. 3 of Franklin Square Collection, and were all sung in full chorus, the music, of itself, comprising a delightful programme.

The address of Simon P. Eby, Esq., of the Lancaster bar—a gentleman well known as one of the most enthusiastic tree-planters in this section of the State—contains so much of interest and practical value in this connection that we publish it almost entire as follows:

A TALK ABOUT TREES.

BY SIMON P. EBY.

I am here at the invitation of your principal to have a talk with you about trees. Our talk, I am sure, would be more interesting if we could have it in the woods, under the trees—under the branches of some of the giants that lift their tops far up into the blue sky, so high that it strains the neck and makes the head dizzy to look up at them; and that send their roots deep down into the earth to brace themselves against the storms.

I would like to go with you and your teachers some day to see some of them, and not only to have "a talk about trees," but to hear *them* talk. For you must understand that trees are not without language, and different trees have different voices. I have heard them sigh and whisper; have heard them rustle their leaves in a way that sounded very much like laughter, in fact, came about as near to laughing as it is possible for trees to express that emotion. I have heard them moan and groan, as they swayed to and fro in the wind, grinding their heavy limbs against each other; and have listened to a whole forest of trees roaring together in one grand chorus. I have seen a beech tree shiver, as you or I shiver on a cold day. But I want to tell you particularly why we ought, all of us, to take an interest in the planting of trees.

A country without trees is a place not suitable, nor pleasant, nor even healthy to live in. Experience has shown that those countries where the forests were all cut down or destroyed, and not replanted have in the course of time become deserts, or barren wastes where none can live. So that it has become very important that we should keep a proper proportion of wood-lands, if we wish our country to remain a habitable land.

Let us see what has been done, and some of the evil effects that have already become apparent. Nearly the whole of Pennsylvania was at one time covered with forests. As the name indicates, it was "Penn's Woods." The settlers, wanting cleared ground on which to raise grain and vegetables for the support of themselves and cattle, cut down some timber, and made fields. This was necessary and proper. But they continued to cut down more woods and make more fields, until they raised more grain than was needed for their own use and began to send it to market; or they manufactured it into flour and shipped it to foreign lands, and received merchandise and money in exchange therefor. They also sold the timber, or used it in building houses or to burn as fuel—they had no coal then. Sometimes the woods were allowed to grow up after being cut—and cut down again. But finally most of it has been cleared entirely away and the land taken under cultivation.

No forests have, as yet, been planted in Pennsylvania, in place of those destroyed, as they are being planted in many parts of Europe. So that now we have only about *thirteen* per cent. of timber area in the eastern part of the state, where there used to be *over ninety* per cent. under forest. There is not enough woods left, and we begin to feel the bad effects of this disproportion.

The forests are the great reservoirs or store-houses for water. Since they have been cut down, there is less moisture in the atmosphere. The rains during the summer season have become uncertain, and move along the larger rivers and mountain ranges, where there is still some forest left, missing the cleared farm lands in dry seasons when most needed. When rain storms do pass over the cleared lands in hot weather, they frequently bring hail with them and damage the crops.

Where a number of trees are together, as in a wood or forest, they attract electricity, and with it the rain from the passing clouds. Hence more rain falls into the woods than upon the cleared land, in proportion to their respective areas. It has also been well established by observation that rain clouds withhold the rain when passing over cleared fields, to shed it down in copious showers into the adjoining woods.

The rains which now fall in winter, spring and autumn, flow off the cleared land, washing the soil away with them; formerly they were retained by the woods. You often see the hill-sides in fields badly washed, but do not see the same kind of washes in a thick natural growth of forest. The roots and fallen leaves prevent the washing. The rain soaks in and sinks into the ground. The earth, along the hillsides, becomes filled with water, which finds its way down into crevices between the rocks, and flows out below in springs all the year round.

When the woods are cut away this condition of things is changed. There is nothing to hold the rain and snow-water, which runs off rapidly; no supply is stored, and the springs dry up. The streams which were fed from the springs get very much lower; so that the grist mills which used to run with water-power now have steam engines to do the work. And the streams swell into destructive floods in heavy rains, which was not the case formerly.

Mr. J. B. Harrison, writing about the destruction of the Adirondack forests, the great water source and supply of the Hudson river, says: "There was and is one natural, necessary and eternal condition for the permanence of these gifts. These mountain springs were sentineled and cherished by the trees. While the forests stand the springs will flow, and all the wisdom and power of mankind cannot keep them flowing if the forests are destroyed."

Forests are not only store-houses for the rain, but serve other very important purposes; as *wind-breaks*, for one.

When cut down, the winds have a wider uninterrupted path, and sweep across the landscape with increased force, drying up the surface of the ground, stunting vegetation, and making the climate generally uncomfortable for man and beast.

Cozy nooks on elevated places commanding distant views; snug farm-houses on hillsides and in valleys; sunny slopes where red-cheeked and golden fruit ripened in quiet orchards unshaken by passing storms; and pasture lands so close to the edge of the woods that the brown chestnuts dropped over upon the grass; where the cattle browsed with manes unruffled by squalls;—these, since the destruction of the forests, have become a play-ground for the winds, where they blow as they list, from north or south, raising or lowering the temperature suddenly and without warning.

Our fathers raised plenty of apples in their own orchards. We are compelled to ship them from distant parts, where the orchards are still sheltered and kept moist by forests.

Trees are likewise beneficial in a sanitary point of view. They impart health and life-giving properties to the atmosphere where they abound. This was made the subject of a lecture delivered before one of the medical societies in Philadelphia not long ago. It was shown that trees absorb through their foliage, which serve them as lungs, noxious gases thrown off by animals, and in that way purify the air and render it more fit to breathe.

We need hardly a man of science to tell us this. Nature teaches as much. Where does the sick man long to go when he can leave his room? To the woods. Where does the maid instinctively trundle her infant charge, in the baby coach? To the parks, under the trees—and how kindly the little one takes to it! Where was our sick warrior ordered to go as the last chance for his life? Among the trees on Mount McGregor. Whither do we all like to escape from the close air and suffocating heat of the towns, when worried and sick at heart, when friends have deserted us, our affairs have gone wrong, and our troubles seem heavier than we can bear? To the quiet woods. Their presence is so soothing; the whisperings of the trees are so peaceful; the forest air is so refreshing. We expand our lungs and inhale deep draughts, as it comes laden with the smell of pines, and the spicy odors of deciduous trees. We take fresh courage, gather new strength, and shake off the weight that threatened to bear us to the ground. We feel better, and more ready to take up the battle of life and try it again.

If we go to the woods in our gayer moods, then "she has a voice of gladness," and repeats our songs and laughter, and the shouts and calls of our companions. Had we a horn at such a time, I think we should be tempted to place it to our lips and make the woods resound like another Robin Hood. Hence even the quietest of folks are liable to become merry when turned loose in the woods; and nutting parties are notably noisy. All this the result of being among the trees.

But as we cannot go to the woods every day—we who live in town—we must try and bring the woods to our doors. William Penn wanted to make Philadelphia a city full of green trees; and he was a "level-headed" old gentleman.

A single tree or a couple of trees have the same good effect as a forest, only in a less de-

gree. So you see it is a good thing to have trees; and if you have none, by all means plant some. If you have them already, plant more every Arbor Day. If you have not room for a tree, then plant a shrub, or fern, or creeping vine. You can always find a corner about the house to accommodate one of these. They require but little attention and become very attractive. The young lady who plants a climber at the corner of the house will be pleasantly surprised to see some morning that the vine has come up to her window to look in and thank her for her kindness; and if not repulsed, will further repay its mistress, by festooning her window with beautiful leaves and bright blue berries. One of our native climbers will do this, and will enter her room if allowed.

I heard Mr. Meehan say that he believed, to engage in the cultivation of plants and flowers will make men and women better morally as well as physically. He related as a fact, that persons traveling in strange countries, where there were no inns, when looking for a place to stay over night, always selected houses—if they could find them—where they saw plants or flowers at the door or windows, having learned by experience that the people who loved plants and flowers were kinder and better-natured, and there was no danger that the traveler and stranger would be ill-treated, robbed or murdered during the night in those houses. And I agree with him.

When we plant and attend to our trees and vines, when we have seen them bud and blossom in the spring, cover themselves with a rich canopy of leaves in summer, turn their foliage into crimson and gold in the fall, throw off their mantles and bare their arms like athletes preparing to wrestle with the storms of winter; when we have watched them growing, spreading their branches wider, and climbing higher each year; when we have sat under their shade, taken down the caterpillars that fastened themselves in their branches, and brushed away the worms that would have eaten their way into their hearts, stood friends to our trees and plants, and they have repaid our friendship, as they will repay it—then, I say, we only begin to value them as we should. And if we value and appreciate our own, we will also value and appreciate our neighbors, and will be less likely to carelessly injure them. Hence we become more considerate, better citizens, and better men and women.

WHAT TREES SHALL WE PLANT?

What kinds of trees shall we plant in our city? We have an almost endless list to select from. There are three or more kinds of Maple—Sugar, Norway, and Silver—to begin with, clean good-growing trees, suitable for street-planting and not much infested with insects; they seem to be properly appreciated by our people. In fact, there are so many along our streets already that the sight of them is becoming somewhat monotonous. Then there is the Horse Chestnut, rather too coarse and stiff in foliage for a fine shade tree. We have two kinds of Linden, the American and the European, both lovely trees if you can get them perfect in shape. They are very desirable because they drop their leaves early in the fall and give us the benefit of the sunshine on pleasant October days. They bear sweet blossoms that attract the bees.

There are three kinds of Elm, of rather large growth, our native variety having long pendent branches that make a very graceful and charming tree. This elm was a great favorite with the late Dr. Thos. H. Burrowes, for many years a School Director of this city, and twice State Superintendent of Public Instruction. He left his mark in school-houses far and wide in Pennsylvania, and in elm trees wherever he went in Lancaster. Unfortunately, of late years, the beetle has made sad work with the English variety; and I notice also that in some parts of the country our beautiful native species has suffered from its attacks.

The Buttonwood and Tulip-tree can be introduced with good effect in suitable places, both being of rather large growth. Then we have also the Ash, a desirable tree for the street-planting. We see them in our cemeteries, and I know of no reason why they should not also have a place along our side-walks.

The same can be said of the Oak. There are several species that I think would make fine shade-trees, but they have never been introduced. I suppose, because they are looked upon as being exclusively a forest tree, and of too slow growth for our fast generation. So they have planted the fast-growing Silver Poplar which is not a handsome tree and soon gets too heavy and unmanageable for safety. Still, they are better than none.

For side yards or lawns we have the Sweet Gum, purple-leaved Beech, Birch, Magnolia, Larch, all deciduous; and, among the evergreens, Arbor Vitæs, Spruces, Firs, and Pines.

And we must not forget the fruit trees for our back yards: Apple, Pear, Peach, Apricot and Quince. I think they can all be raised as well, if not better, in town than in the country, as they are more protected, are closer at hand, and therefore can receive better attention. Fruit trees must be looked after carefully. They become great favorites, and will repay us for extra care bestowed upon them.

HINTS ABOUT TREE-PLANTING.

I am inclined to the belief that much of our failure with trees is the result of poor planting. Not many persons know how to plant a tree, and they will not even accept advice kindly when offered.

I will give you a little experience of my own. Last spring, passing where some friends were about planting a tree, one of them asked me for instructions. I trimmed the roots, showed him how it should be placed, and suggested that the hole prepared to receive the tree ought to be made larger. Just then his partner in the work stepped up, saying to us, "'Get away here! You don't know nothin' about plantin' trees." Jamming the tree into the hole, and tramping the roots down with his feet, he said, "There! that hole's big enough; now fill in the dirt."

It would, perhaps, be best to plant the seed or

nut where the tree is wanted. This would allow the young sprout to accommodate itself to the locality, fasten its roots firmly and develop its branches in a natural manner, so as to need no artificial means to keep it in place. and require little or no pruning.

But as this would take longer than we can wait, we buy our trees out of a nursery, where they have passed through the nursling stage, and been prepared somewhat for their removal. They have already been several times transplanted, by which the spread of the roots has been checked and the formation of fibrous rootlets encouraged.

When a tree is allowed to grow from the seed in an open place unhampered by obstructions in the ground, and not crowded by other trees, the spread of the root will be about equal to the spread of the branches. When we get them from the nursery, even where cultivated with a view to subsequent removal, only one-half, sometimes less, of the roots come with the tree, the remainder being left in the nursery grounds. It would be too difficult to take up *all* the roots; nor can they be well transported without injury.

How to Plant.—Having received the tree, and selected a place for it, dig a hole wide enough to hold the roots without bending or doubling any of them. The hole should be deep enough to place the tree about the same depth in the ground as it stood in the nursery, which can be told by the surface mark around the butt.

The bottom of the hole must be *highest in the middle*, and have a gentle slope outward in every direction. It must not be kettle shaped, deepest in the centre or rounded up at the sides. This is important. If the place is low and wet, it should be underdrained. In digging, keep the best soil, which is found nearest the surface, separate. Cover the bottom of the hole when made, with this soil, well pulverized, an inch or more thick for the roots to rest upon.

Should you want to apply fertilizers, use well-rotted barnyard manure, broken and pulverized, or undissolved ground bone. Anything containing acids or alkali should be avoided; it may do harm. The manure or bone should not touch the roots, but be placed around the sides and below, so that they can reach for it. It is advisable to mix the fertilizers with equal parts of soil before applying them.

Prepare the Roots.—With a sharp knife, cut off neatly and smoothly all broken or bruised ends of the roots, making the cut along the under side of the root outwards, at such an angle as will bring the cut ends flat upon the good ground on the lower surface of the hole.

Examine for borers or other insects usually lodged in the butt close above or among the roots. Pick them out with a narrow knife blade or wire, wounding the tree as little as possible. The presence of these pests is indicated by dark spots in the bark, the exuding of gum, or the presence of finely-scraped wood like saw-dust.

Cut Back the Top.—The tree having lost a portion of its roots, it cannot support or supply with sap a full top, therefore it must be cut back to a corresponding size, trimming the branches so that the top will be conical in shape.

Everything being ready, lift the tree in its place, with the strongest branches and roots in the direction most exposed to the wind. Trees will grow away from the wind. If a shade-tree, place the most perfect side in the direction where it can be most seen and admired.

While an assistant holds the tree upright in its place, fill in the good ground, pulverizing and working it with the hand carefully and thoroughly in among all the roots, so that no vacant spaces are left, straightening and combing the rootlets outwards and downwards, dividing them so that they do not touch each other but are separately and closely imbedded in soil.

If there are two or more layers of roots growing out of the trunk one above the other, as is sometimes the case, the soil must be worked in between the several layers so that they do not come into contact with one another.

To aid the working-in process, grasp the trunk of the tree, and shake it up and down several times. The ground under the middle of the tree should be firmly packed to prevent the tree from settling. Continue filling in until the roots are evenly covered several inches, then press the ground down gently and firmly with the foot. Pour in enough water to thoroughly moisten all the filled-in ground and give it time to soak in. Afterwards fill in the remaining ground, making the hole a little more than even full.

If the planting is done in the fall, draw the ground closely up around the trunk so as to turn the water away from it during the winter; this is to be leveled off the following spring. If the planting is done in the spring, leave the surface of the ground even.

Stake the Tree.—The simplest way is to drive a single stake to windward, so as not to disturb the roots, and fasten the tree to this in an upright position with a straw band. A few turns of tying yarn, around the band at the end nearest the tree, and a few at the end close to the stake will help to keep it in place. For a larger tree, drive two stakes on opposite sides, connect them with a cross-piece and fasten the tree to it.

Wrap the trunk where it rests against the cross-piece with a rag or other soft material, to prevent rubbing, and to prevent the string from cutting the bark. It should not be tied or wired so as to interfere with the circulation of the sap.

In the month of April wrap the trunk of the tree with strong wrapping paper, from two inches below the surface of the ground, a foot and a half upwards, as a protection against borers. And mulch the ground around it with partly decayed barn-yard litter or decayed leaves to keep the ground moist in the summer.

If any watering is to be done, make half a dozen holes, with a pointed stick the size of a broom handle, down to the roots, so that the water can soak down more readily.

For further directions consult some book on the subject. A thing that is worth doing at all, should be well done.

Having spoken to you of the utility of trees, and given a few hints how to plant them, I desire to refer you to other qualities which they possess.

Nature seldom creates the *useful* without

combining it with the *beautiful*. Trees are peculiarly the children of Nature, and she endows them with strength and grace, and beauty and majesty. It is said that the graceful arches formed by the interlacing branches of the forest trees first suggested the Gothic arch. The pillar, with its capital, is but an imitation of the trunk of a tree, with budding leaves at its top; and we may well believe with the poet Bryant,

"The groves were God's first temples."

For strength and symmetry, the mind of man has never yet conceived a shape to excel that of a tree. The lighthouse, that has successfully withstood the waves on the dangerous Eddystone rocks, after other structures were washed away, is built in shape like the trunk of a tree; with a wide-spreading base, like the spreading roots of an oak or beech, firmly mortised into the rocks below.

Can you tell me of a form more graceful than a young hemlock or birch; or of an object more stately than one of our tulip trees or native white pines?

There are four of these pines at Mt. Gretna, standing like sentinels at the entrance to the park. Old and scarred and weather-beaten by the storms and sleet of many winters, although of rapid growth, they must have been good-sized saplings when Washington's guns boomed at Yorktown. They still seem to be sound at the heart, as they lift their evergreen crowns above the surrounding forest, making soft music in the summer breeze. Some evil-disposed person has cut deep gashes into the side of one of them; and some modern vandal, who ought to enjoy the inside of a workhouse rather than the freedom of the woods, has tried to burn down another of them by building a fire against the trunk. The trees have bound up their wounds as best they could with a layer of resinous sap, leaving, however, ugly scars.

Can anything be more faithful to its trust than the beech tree. The initials carved in its bark are still there, although the hand that carved them has turned to dust; and the letters, enlarged and grown out of shape, as the trunk has thickened, will be faithfully kept until the tree itself goes down before the axe or the storm.

Was there ever princess, with all her finery, dressed in satins of old gold, like the Chestnut tree, when in bloom? Can you wish for a thing more sturdy than the Ash? more chaste than a Maple? sweeter than the Magnolia, or more fragrant than the Wild Apple? Did you ever see anything more tremulous than the Aspen? And where will you find frontlets borne aloft as proudly as the Buttonwood, bears aloft his great antlers? No servitor ever bore cup before his king with better grace than the Tulip-tree lifts its golden chalices to the sun. The Hickory encases within its trunk the heat of many summers, to be yielded up on our hearths to warm and cheer our winter festivals.

And lastly: Do you love to contemplate majesty? Then study the Oak. He is not here for a brief stay—counts his life not by years, or decades, but by centuries. He is not in a hurry but moves slowly as becomes his dignity. At first only two or three weak leaves mark the place where the acorn was dropped. The second year a field mouse might cut the stem in two by a nibble. The third, fourth and fifth years do not show much upward growth; other trees have out-stripped him. But, on examination, it will be found that he is all the time making roots and sinking them into the earth, laying a broad foundation for the future. After this he widens at the butt, girding himself like an infant Hercules for the long work that is before him. He grows slowly but steadily.

He cannot claim credit for early habits: is about the last to appear at the annual forest assemblies, and retires late. The first calls of Spring do not move him. The maple has flushed into scarlet; the willow has hung her catkins over the stream; the cherry and apple have begun to shed their blossoms, and the birch and chestnut are already in leaf before he stirs. After these minor actors have commenced their parts in the sylvan drama, he comes at last like the king in the play, heralded by salvos of heaven's artillery. And when he has put on his royal robes, he does not lay them off until they have turned to purple and brown, and the flurries of the first snows are among his branches.

As the years roll by, he adds ring upon ring to his girdle; spreads his branches wider and wider and lifts his leafy crown yet higher into the sunshine. When other trees around him have grown old and fallen to the ground he still enjoys lusty life, and draws new strength from the mouldering trunks of those he has outlived. Two generations of men have come and gathered his acorns and passed away to give place to a third that is growing old under his branches. Dynasties have been founded and perished, governments have been formed and overthrown, the fates of nations decided, and the course of events changed since he began his growth; and still he stands as he has stood through all the vicissitudes of time, a symbol of dignity, endurance and strength—the acknowledged monarch of the surrounding forest.

In England, where trees are more regarded and better cared for than with us, Oaks have been known to live nine hundred years. In this country they are cut much earlier. American authorities say an oak is full grown at two hundred years, but it lives much longer. In 1859, Mr. Downing wrote of the Charter Oak at Hartford as being still in a green old age. It was already a good-sized hollow tree when the charter was hid in it, and must have been between two hundred and fifty and three hundred years old when Downing wrote of it. He also speaks of the Wadsworth Oak near Geneseo, New York, which measured thirty-six feet around the trunk, and of another on Long Island thirty feet in circumference.

I know of some few large trees in the northern part of this county. Only a few years ago two oaks were felled—not very large trees—that had more than 150 rings in their trunks, showing that even they had stood over a century and a half.

You have read of the famous Chestnut tree on Mount Etna, so large that in the interior of it a

house had been built; and of the great redwood trees of California.

In our literature frequent mention is made of trees. Downing writes charmingly about them. Bryant who, above all others, is the poet of trees, speaks lovingly and reverently of them; Longfellow places his village blacksmith under the spreading chestnut. So in German poetry we find the tree a favorite object. Virgil speaks of his friend reclining under the beech tree. Some of the old heroes of antiquity also were great arboriculturists, as well as warriors and statesmen.

And now, my young friends, I have plead for the trees before societies, before committees and legislatures, and before the Governor, but have never had the opportunity to speak on this important subject to an assembly that can have more influence over the future fate of our forests, and consequently over the fate of our country, than the three hundred pupils that are now before me.

Only a few years, and the present generation will have passed out of active life, and the government of our city will have passed into your keeping, as well as the joint government of the State and Nation. Let me charge you not to forget what Mr. Harrison truthfully says: "Neither the *wisdom* or *power* of man can keep our springs flowing, and our streams running after the trees have been destroyed."

When our hydrant water gets too impure we can filter it, or boil it, or obtain it from some other source. We take a thousand draughts of air to one of water, and yet I know of but one mode of filtering or purifying the atmosphere, and that is through the foilage of trees, and vegetation. The trees along our street are the lungs of our city. See that they are renewed year after year, and not utterly destroyed. See that no more tenement houses are built along our alleys. The city should not be too thickly built, and—*there ought to be a Park!* Some hundreds of acres of land, within easy access of the city, should be planted in trees, to which, as a place of public resort, our citizens could go for health and recreation in the hot season.

And you, young ladies, do not forget that you may wield an influence for good even greater than your brothers who cast the ballot and direct the government. Whether as teachers or heads of households, you will have the control of the young. See that you make your homes pleasant and attractive, and yourselves and those you love healthy, by surrounding your habitations with health-giving, air-purifying trees. And do not forget the examples of the Old World, where lands as fair as ours, once inhabited by a numerous population, shaded by groves and watered by flowing streams, have, mainly through the total destruction of the trees, become a barren desert, without vegetation to support human life—haunts only for the jackal and vulture, that feed upon those who perish while crossing it.

Prof. R. K. Buehrle, City Superintendent, read the following interesting report of the result of tree-planting on Arbor Day:

REPORT OF SUPT. R. K. BUEHRLE.

Of the exercises of Arbor Day last spring it is not necessary to say more at this time than that they were greatly enjoyed and productive of much good. How much only the years to come can tell, for the influence of a good deed is bounded in extent only by immensity, and in duration it is swallowed up in eternity.

The example set by the Board of Directors, who expended, under the direction of its efficient Property Committee, $58 for trees and shrubs, was but the signal for greater effort on the part of the schools and the people.

It may, therefore, be interesting to learn what the children did, or caused to be done for them in the way of planting at their homes, exclusive of what the parents planted on their own account on Arbor Day. The pupils of the 39 schools whose teachers sent in their statements to me, report a grand total of 2700 trees, shrubs, vines, and annuals as planted on that day exclusive of what was done on the school grounds by the school authorities and by the pupils.

If, in addition to this, there be added for our citizens generally, what the sales of nurserymen and others would indicate as having been planted because of Arbor Day, the total would aggregate not less than *four thousand* for Lancaster alone. We give the number reported by each school, with the name of each teacher, in the statistical table below. Numerically, the principal kinds of trees planted rank as follows: Peach, 982; cherry, 194; plum, 105; apple, 98; pear, 82; quince, 68; apricot, 46. There were also 124 grape vines planted, and of shade trees, the maple stands highest numerically—43. The beautiful was kept in mind, too. There were 106 rosebushes, 50 shrubs, 21 lilacs, and 6 evergreens, besides vines, creepers, bushes and shrubs literally "too numerous to mention." An idea of the variety of taste and choice may be formed when it is considered that the range of selection is from the oak and the pine to the Virginia creeper and the fern.

In the statistical report the number 434, almost one-sixth of the entire planting, speaks with sufficient eloquence of the practical interest manifested by the Boys' High School.

There is, however, nothing striking in the figures of this report to show what was so well done by the teachers and pupils of the Rockland Street schools, and I will therefore invite your attention to what they have to say: "On Arbor Day there were planted by the committee two maples and four Virginia creepers. Since then we have laid out and sodded a grass plot containing 110 square feet, and a flower bed 10 feet by 2½ feet, containing peonies, dahlias, lilies of the valley, and blue flags. We have added to the shrubbery a maple, a cherry, a sweet bean, three paw-paws, a willow, three lilacs, one snow ball, one California spice, three roses, one English ivy, and one Virginia creeper." Such is the eloquent record of the unselfish, self-denying lahor of those teachers and their pupils.

Dr. Wickersham being called upon, responded: This call for a speech is quite unexpected. I came here for good music, and

I have had it and enjoyed it; though not a musician, it is a great pleasure to hear young people sing—such singing as you have here to-day is as good a thing perhaps as planting trees on Arbor Day. I am not poet enough to hear the trees talk and laugh and clap their hands; my views are of a practical kind, and I would like to live long enough to see a beautiful public park laid out; and you young people who go out from this school must accomplish it if it be done. Therefore it is well that you are learning to know and love the trees. We cannot have a park now—our city fathers would be terrified at the cost, and even a vote of the people might be influenced the same way; but when your day comes, and you are the makers of public sentiment, solid old Lancaster ought to take a new departure. I know, and your teachers know, and no doubt some of you know, that a park would be profitable in the money-making sense—it would increase the value of property more than enough to pay for itself—but the community does not know it yet. When you go out into life and are moulding the life of the old town, things will move, and I hope to live long enough to see it. They know better across the water—there is no city of our size in France, or Germany, or even Denmark, that has not its public park; and often, as I enjoyed my walks through them, I wished we had one here at my home. But we must wait till you do the voting, and I hope you will not forget the lessons of to-day.

Meanwhile, why might we not challenge our neighbors of Millersville, who think they can do almost anything, to meet us halfway in making an avenue of trees between our towns. No doubt the consent of the turnpike company and the property holders would be gladly given, and I will agree to furnish 100 trees—yes, and be responsible for 500 rather than be beaten. What a magnificent drive it would be! I remember the drive over part of the road from Paris to Brussels, when for hundreds of miles—several days' travel—the road was bordered with lofty poplars. Let us do something for ourselves. We can do our half of this four-mile drive—let us see if Millersville will undertake the other. The future would honor you as pioneers in good work of this kind: Remember, whenever you are ready for this, I want my share in it.

Rev. Charles L. Fry said: Nature and revelation are the two great books of God. You have heard and seen what the book of nature tells us about trees, but in all its wonderful variety there is one kind of tree it does not show us—a fruit-bearing tree which does not wither. We have our evergreens, and how beautiful they are! but they bear no fruit; and not adornment, but usefulness, is the highest law. And we have our fruit trees, too, but at this season of the dying year their leaves fade and fall. But we turn to the book of revelation, and we find what the book of nature has not shown us—the fruit-bearing tree whose leaves never wither; you will find it described in the first Psalm—it is the righteous man. And that is the kind of trees to which you and I may and should grow. We must live so that the heat of temptation and trial will not weaken us, but make us grow. We must guard the tender plant of youth against the blight of worldly riches and pleasure, which prevent soul-expansion. We are apt to expend too much time upon our bodies, and too little upon our souls. Midas transformed all things into gold by a touch, but now men are transformed by the touch of gold. Sometimes, again, our young trees do not flourish because there is a worm at the root—a secret sin, a fatal habit not dreamed of by parent or teacher—beware of these. Sometimes the leaves are untimely torn from the stem by storms of quarreling and strife. Against all these things we should continually be on our guard; that we may live while young so that we can enjoy the retrospect of life. Even the good man grows old physically and passes away; but there are leaves that are more beautiful in November than in May. They dissolve away, but they never wither: Christ, Paul, Luther, have never withered. Meanwhile we must bear the fruit of a useful life, for every tree that bears no fruit shall be hewn down and cast into the fire; and so we shall be ready for transplantation into the garden of God, where we shall dwell forever in perpetual verdure and fruitfulness.

Rev. J. Max Hark referred briefly to the influence and place of trees in literature. From the earliest days when the impassioned Hebrew poet lifted his eyes to the hills and drew inspiration from the cedar and the fir; from the times when the muses of the ancient Greeks sang amid the wooded slopes of Parnassus; up to the modern days of Wordsworth, Bryant, Lowell, of Irving and Craddock, trees and their living beauty have furnished inspiration and sustenance to literature to a larger extent than any other work of nature. Take away trees and the references to them out of our literature, and you have it as barren and bare as the

treeless prairie and desert. They are as essential to our spiritual life as to our physical. He who plants a tree is furnishing food for our future literature as well as contributing in some measure to the public health and happiness.

Mr. J. P. McCaskey, principal of the Boys' High School, followed in some general remarks.

REMARKS BY MR. M'CASKEY.

The report made by Superintendent Buehrle presents a showing of Arbor Day work in Lancaster that will be no less gratifying to our citizens than it is creditable to our schools and school authorities.

It is, however, not out of place here for us to make some brief reference to what the Boys' High School has been doing in this connection. Within less than two years more than *four hundred* choice fruit and shade trees have been planted by the pupils and teachers, nearly all with their own hands at their own homes, or on the grounds of neighbors or friends. Including everything planted, the aggregate would not be less than *five hundred* trees, grape-vines, flowering shrubs, roses and climbing vines. This work was begun in the spring of '84—when each boy planted his tree—and these, added to what they have planted since the appointment of Arbor Day, swell the aggregate to the figures named above.

These facts but afford another illustration of how blind we are to see, and how careless to improve our opportunities for effective work. Had we taken hold of this matter with earnest purpose twenty-five years ago, what thousands of trees would now be growing—with their wealth of annual fruitage,—that have never been planted! But while we sleep, or are careless, or selfish, the years go by and too often leave us empty-handed, with abundant cause for unavailing regret. It were surely wiser to "improve the time."

Our spring Arbor Day was bright with the sunshine of promise. The sky of this autumn day is heavy with clouds, and the winds blow chill through boughs that must soon be leafless. But sun and rain are alike good in their season. So let the trees be planted, be it in the early springtime or late in the autumn. And when planted, let them be cared for and protected, in the spirit of Morris' old song that you sing so well.

A few days since I fell in with an old man who knew Geo. P. Morris intimately. He was enthusiastic over the "noble fellow"—as he called him—who has long since gone over, we trust, to some Paradise where vandal axe never gave cause for such an appeal as "Woodman, spare that tree." But Henry Russel, who wrote the music of your song, lives yet in England, an octogenarian; and I would that he were with us to-day, on this occasion, to hear again at its best his familiar air—which has gone round the world in its missionary work of defense to the helpless, preaching the glad gospel of humanity towards the trees.

ARBOR DAY CELEBRATION.

BY SUPT. J. B. PEASLEE, CINCINNATI.

TO correct the impression made by statements that have appeared in educational journals and elsewhere in regard to "Arbor Day," and to give Cincinnati and her schools the credit they deserve, the following history of the day and of tree-planting celebrations is given. "Arbor day," for the planting of trees for economic purposes originated in Nebraska about twelve years ago; but the celebration of Arbor Day by planting *memorial* trees, with literary and other exercises, originated in Cincinnati, at the organization of the American Forestry Congress in 1882, at which time the Cincinnati public schools had the honor of introducing tree-planting celebrations into the public schools of the country; and it is a source of congratulation that our example has been extensively followed by public schools in the United States and the Dominion of Canada. Through the efforts of State Supt. Butcher, of West Virginia, and Supt. Morgan, his successor; through Supt. Holcombe, of Indiana; State Supt. Apgar of New Jersey; State Supt. Higbee, of Pennsylvania; the School Inspector of the Dominion of Canada, Arbor Days have been designated, and the great school systems of these States and of the Dominion celebrate the day after the "Cincinnati plan," as Hon. B. G. Northrop so justly calls it.

Two years ago the Governor of Nebraska, the State in which Arbor Day originated, in his proclamation naming the day and offering the State reward to the person who would plant the greatest number of trees, called upon the schools to plant memorial trees after the plan of some of the Eastern States—i. e., the "Cincinnati plan"—and last year, according to Dr. Northrop, Kansas followed.

The schools in many places outside of the States named above have adopted this beautiful custom of planting memorial trees, attended by appropriate literary exercises. In these celebrations not only teachers and pupils take part, but also thousands of other citizens. In this way many thousand trees are annually planted and dedicated to authors, statesmen, soldiers, pioneers, and other distinguished persons; and through these celebrations not only the children, but the public at large, are being educated to appreciate the great importance to the climate, soil, productions, and to the beauty of the country, of the planting of trees, and

the cultivation and conservation of the forests that yet remain to us.

Except in a few of the western states that are almost devoid of natural forests, where the planting of groves and forests is a necessity on economic grounds, but little attention may be paid to Arbor Days,—however eloquently their object is set forth by Executive Proclamation and by Forestry associations—unless the celebration feature is adopted; and this will not be done, except possibly in a few places here and there, *unless the schools take hold of it.* How important, therefore, to the highest interests of State and Nation that Arbor Day celebrations be kept up, year by year, by the Public Schools!

As frequent requests are made to this office for the pamphlet entitled "Trees and Tree-planting, with exercises for the celebration of Arbor Day," prepared by me, with preface by Hon. Warren Higley, President of the American Forestry Congress, permit me to state that it is now published by the National Bureau of Education, and can be obtained, free of cost, on application to Gen. John Eaton, U. S. Commissioner of Education, Washington D. C.

EDITORIAL DEPARTMENT.

THE SCHOOL JOURNAL.

LANCASTER, DECEMBER, 1885.

E. E. HIGBEE. - - - - J. P. McCASKEY.

"Ye may be aye stickin' in a tree, Jock; it will grow when ye're sleepin'." *Scotch Farmer.*

SCHOOL grounds will be better shaded, fenced and kept, in very many localities in Pennsylvania because of Arbor Day. From reports received we learn that although in some parts of the State the weather was unfavorable for out-door work, yet many thousand trees were planted on October 29th and the days immediately thereafter. Attention has also been prominently directed in many districts to schools so located as to be without adequate grounds, or with such bleak and barren surroundings as repel rather than attract directors, patrons, teachers, and pupils alike.

The account of the observance of the day in Lancaster given in this issue of *The Journal,* will be found interesting. The "Talk on Trees" by Simon P. Eby, esq., gives valuable hints as to the selection and the careful planting of trees. The report of Supt. Buehrle showing a total of twenty-seven hundred (2700) fruit and shade trees, shrubs and vines as the result of the Spring and Fall Arbor Day planting, speaks with emphasis of the interest taken by himself and his schools in this good work. The sale of trees from the nurseries in the vicinity has been such as to indicate a total of probably four thousand trees, etc., planted in Lancaster alone because of the appointment of Arbor Day. And if this be so large for a single locality—what should it be for the entire State!

EVERY real teacher knows that children can be *inspired;* he knows that every human being is susceptible to influence from other human beings; that human beings are the most powerful agencies on earth. It may be laid down approximately that no one who cannot interest another can inspire him. Hence the first effort must be to attract and rivet the attention. There must be efforts made to get the pupil out of and away from himself. Selfishness and timidity centre the pupil's thoughts upon himself. But it is neither words nor lessons that can inspire children. They must be taught to feel; they must be penetrated with larger ideas; they should ponder the thought of an unseen and spiritual Ruler. It comes through the atmosphere in which they exist. Hence it may be laid down further, that no person who cannot create a spiritual atmosphere in his school can inspire his pupils. There is such a thing as causing the children to feel the moment they enter the school-room that a new world is before them; that the dingy walls, the worn floors, the unattractive lessons are nobler and better than even the green fields and the open sky.

THE Institute programme is usually made up weeks in advance of the session, but it sometimes happens that an instructor, from illness or some other cause is unable to be present, and another must be substituted at brief notice by the Superintendent. It gives us pleasure to name, although at the "eleventh hour," as competent persons to whom application may be made for excellent service: Supt. R. M. Streeter, Titusville, Pa., on "Æsthetics in the School Room;" Miss Belle Thomas, Normal Park, Illinois, on "The Ungraded Schools and their Needs;"

Prof. John Ogden, Washington, D. C., on the "General Work of the School Room;" and Miss Lelia E. Patridge, Normal Park, Illinois, author of "Quincy Methods Illustrated." Owing to recent change of plans, Miss Patridge will be disengaged for the first three weeks in December, and may be secured for Institute work during that time.

IN order that an aggregate of results of Arbor Day may be given in the annual report of the State Superintendent of Public Instruction, it is very desirable that each City, County and Borough Superintendent be heard from *not later than December 1st.*

SUPT. WOODRUFF writes under date of Nov. 5th: "Bucks county had a very successful Institute. Out of 294 teachers in the schools, 288 were present. Absent with good reason 4; absent without explanation, 2. Present at every session, 213; absent but once, 26; absent twice only, 18; absent more than twice, 31. The attendance for the nine sessions was 93 per cent. The attendance of the graduates of Normal Schools (17 in number) was 91 per cent; of those holding permanent certificates (11 in number) 83 per cent; and of the 50 holding professional certificates, 92 per cent—giving the nearest unit. I have carefully analyzed the report of attendance, because of the much ado of some of our newspapers about the change in the law. So far as Bucks county is concerned, the change has made no perceptible difference in the attendance. We sustain the Institute, law or no law."

We may add that the enrollment of teachers in Berks, Lancaster, and Dauphin counties, was also 98 per cent. of those engaged in teaching.

WHEN we were boys the Bible was our reading book in the schools, and much of our familiarity with its pages dates from those early days; and when we note in the average school the wide-spread ignorance of the Book that prevails, we are glad that it was our good fortune to be a school-boy so many years ago. School books have made wonderful improvement in certain lines since then, but in the long reach of their influence, has anything much better than the old Bible, or the old "English Reader" yet appeared? Says John Ruskin: "My mother forced me by steady daily toil to learn long chapters of the Bible by heart; and to that discipline, patient, accurate and resolute, I owe not only much of my general power of taking pains, but the best part of my taste in literature." And John Quincy Adams: "I speak as a man of the world to men of the world; and I say to you, *Search the Scriptures!* The Bible is the book of all others, to be read at all ages and in all conditions of human life, not to be read once or twice or thrice through, and then laid aside, but to be read in small portions of one or two chapters every day, and never to be intermitted unless by some overruling necessity."

THE following facts of special interest to Pennsylvania we take from a late issue of the New York *School Journal:* "Potter county has had a prohibitory law for many years, no strong drink being sold anywhere in the county. As a result of this, the county jail is generally empty, the criminal court has little to do, the people are intelligent and moral, and the schools are open a larger part of the year than in most other counties. It is the only county in the State that has a lady as county superintendent—Miss Anna Buckbee. She is making many sacrifices in the interest of the schools, and is one of the most efficient superintendents in the State. thoroughly in sympathy with the new education."

THAT the pupil shall have a substratum or foundation of character is of the utmost importance. It is sometimes termed moral education, but this is a definition that frequently deludes. It is the structure of the individual; it is the nature of his innermost nature. The subject is too little considered, and hence the teacher so often goes into the school-room unprepared to address his pupil's spiritual nature. It is necessary for the pupil to understand that the teacher is in *earnest;* that he means what he says, and that he lives as he talks.

IN his message to the Legislature of Pennsylvania, Governor Pattison made reference to the liquor traffic as follows:

I have no hesitation in pronouncing that, in the judgment of the Executive, there is no more wide-spread and debasing evil, alike injurious to the morals, health, public usefulness, law-abiding spirit, happiness and prosperity of the people, than the present virtually unrestricted sale of intoxicating drinks. There is no disinterested and careful observer, no student of practical government, who, if he speaks his mind, will not admit that drunkeness is the most prolific cause of poverty, crime, misery and sin that afflicts the people. The convicts in our prisons, the paupers in our almshouses, the inmates of our insane institutions, and the inhabitants of the abodes of squalor and shame are largely recruited from the dram-shops and taverns.

THE recent death of Prof. J. V. Montgomery at Denver, Colorado—whither he went some months since, in the vain hope of partial restoration to health—removes from among the teachers of Pennsylvania one of the best known and most widely respected men in the profession. We are indebted to Prof. A. R. Byerly, of the Millersville State Normal School, his associate in the Faculty for more than a quarter of a century, for an interesting biographical sketch, prepared at our request, which will appear in our next issue. It was designed for the present number, but when received —after nearly all the other matter was in type—it was found necessary either to condense or to hold it over; and we have preferred the latter course both from the wide reputation of the good man gone, and out of respect to the memory of a personal friend.

WE have transferred to our columns suggestive extracts from an address at Harvard College, in June last, by William Henry Rawle, Esq., an eminent member of the Philadelphia Bar, on the subject our "Educated Unemployed," having reference mainly to the overcrowded professions, in which there is as much anxious waiting and painful hope deferred as in any other of the unsettled vocations of this transition age.

This significant title furnishes the counterpart of the unemployed amongst manual laborers and corresponding classes with less of education and many times with equal uncertain and fluctuating opportunities to gain a livelihood; but the full discussion of these complex problems of social science would lead us into the domain of political economy, whither it is not our province to follow it.

The portions we have given are selected because of their educational interest, and their vigorous exemplication of the value of thorough educational training in arming men for life's battles and vicissitudes, and for the rational and enlightened enjoyment of life in the midst of its struggles, and after its victories have been won; and as such we commend them to our readers who not only do their own thinking, but enjoy the stimulus of independent thinking on the part of others, whether it harmonizes with their own preconceived opinions or not.

As to the special achievements and monuments of past ages, it is sufficient to remark that the builders of cathedrals and Roman acqueducts could not build a railroad, an ocean steamship or a Brooklyn bridge, pierce the Alps, or shatter the Flood rocks. The conditions and appliances all were wanting. Science and mind did not then reach so far. The nineteenth century need not be ashamed of its comparative record.

THE *Philadelphia Press* is right, and our views are in full sympathy with the following paragraph from its editorial columns: "The decision that school teachers are bound to attend county institutes, whether they receive pay for their time or not, is probably in full accord with the spirit and requirements of the law, but it involves a hardship for a great many worthy men and women who at best are notoriously underpaid for their services. The county institute is a valuable feature of the school system, and its influence for good increases yearly, but it will never achieve the full possibilities of its usefulness until the burden of the expense of its sessions is lifted from the teachers and placed squarely upon the shoulders of the tax-payers. The custom of closing the schools for a week, cutting off that much of the teacher's pay and compelling her to pay her own expenses for travel and board in attending the institute is a gross injustice, discreditable alike to the law and those who make it. Attendance at the annual institute should be compulsory upon every teacher—there is no question about that—but the salaries of teachers should go on without intermission. The institute is designed primarily for the good of the schools—not for the benefit of the teacher—and it should be conducted at public expense. Compulsory attendance at the expense of the individual teacher is an injustice and a shame."

THE attendance at the County Institutes has been very large—most gratifying indeed to Superintendents and Teachers who maintain that teaching is slowly growing into a profession. We have seen no better evidence of the substantial quality in this new profession than that afforded by the almost universal attendance of the teachers at the Institutes thus far held this season. Some would-be-wise people were ready and emphatic with all possible suggestions of mischief that must result to the Institute from the "twenty-day law." But they have read the signs very foolishly. The new law has given the teachers of Pennsylvania a splendid opportunity to show their quality, and splendidly have they met the situation. This, however, does not in the least modify or alter the fact that the law should be so amended as to require that they be everywhere paid by the district in which they

are employed, for the week of attendance upon the annual session of the Institute. Considerations alike of private right and public policy must commend this measure to the good judgment of our legislators.

AN ITINERARY WEEK.

BERKS COUNTY INSTITUTE.

AT early dawn, Monday, October 19th, we started from Lancaster, *via* Harrisburg, for Reading. Admiring the rich green of the growing wheat fields—wondering at the wide-spread glory of the glowing autumnal woods dipped in dyes of a thousand hues—looking down into the eddies of the noble river, where the fallen leaves had gathered and were fluttering all golden in the rising sunlight—listening to the chattering jays happy as though the withered golden-rods had not already sent their companions southward, telling them that winter is near—and thinking meanwhile how some gifted Theocritus might touch with tuneful lips his waxen pipes and waken all the Nymphs and Fauns and Satyrs with revelry, making this river valley outrival Arcady, we were startled by the discordant cry of the conductor, "Harrisburg—passengers change cars," etc., etc., and all the glory of the fields had fled, and all the color faded from the skies.

Office work finished, again we start, and soon the beautiful scenery of Lebanon Valley entrances the phantasy, until reaching Reading we are aroused to the fact that we must, by appointment, meet the assembled teachers of Berks county in their annual convention. The greeting of Superintendent Keck was cordial, and the enrolment of teachers already organized and at work, was unusually large. Valuable instructors were present, and we had the pleasure of listening again to the solid and thoughtful remarks of Dr. E. E. White, of Ohio. He attempts no *ad captandum* methods of address, but with great logical precision and with a conscientious earnestness which begets confidence, he challenges at once the serious thinking of his audience. His long experience in school work enables him to render practical all that he says; yet no one who hears him can fail to see that nothing with him can be practical before it has gained a firm, rational conviction in his thought, and even then it must show itself to be in harmony with right moral principle before he can give it his willing assent.

We had the privilege also of hearing Superintendent Balliet. Evidently he is studying with great care and thoughtfulness the deep subject of child-life, acquainting himself with its content, its far-reaching possibilities and the proper laws which should regulate its development. No higher theme can engage a teacher's study; and all so-called methods of teaching must here find their real test: for the child was not made for either text-books or school, but these were made for him. We feel assured that Supt. Balliet's thinking and methods will be of great service to the Reading schools, and indeed to all teachers whose object in teaching is to carry their pupils through a true ethical process into developed manhood and womanhood.

We regret not having been able to hear the other competent instructors whom the careful Superintendent had engaged. Other points of visitation were too pressing. In looking over the names of the teachers we saw at once that they were prevailingly German. This of itself was sufficient assurance that no element of philosophic thought referred to by any instructor would escape attention. The German mind, by its own genius, turns inward. It is, *per se*, introspective, and takes more pleasure in grasping the law than in gazing at the phenomena in and through which the law utters itself. It seemed home-like to talk with these robust, hearty teachers, and mark how they gave to our thinner pronunciation of English so much more of the hearty fulness of the mother-tongue.

CRAWFORD COUNTY INSTITUTE.

The journey from Reading to Meadville, whether you follow up the Lehigh river or the Susquehanna and its branches, is most charming. No words can paint the mass of colors which were glowing on all the hills and through all the valleys that bright October day. The crimson gum, the golden hickory, the marvelous maple—each leaf blushing to the very tip, the scarlet sumachs, and a thousand other trees, and shrubs, and clustering vines, vied, one with another, to adorn the river's far-winding curves with their dazzling tints. The weather was itself delicious—a dream of summer—and the very air was filled with gold and amethyst. No valleys are so picturesque, so endlessly changing in their beauty, so graceful and at the same time so grand in the sweep of cliffs and wooded hills and mountains that hem them in, as those of Pennsylvania.

It was afternoon when we reached the

beautiful city of Meadville. We went at once to the Court-house and found it crowded with teachers and friends of education—so crowded, indeed, that we had difficulty in pushing our way in to report to Superintendent Sturdevant. A moment's glance revealed the fact that Crawford county had lost none of its well-known interest in the common schools. Superintendent Luckey was in the midst of one of his most practical talks to the teachers, and, as usual, good solid sense and humor vied with each other throughout the whole address. This valuable educator accepts no theories until he has put them to a thorough practical test in his schools. When satisfied with their correctness and utility, he becomes their fearless champion, and defends them against all comers with lance, or broadsword, or battle-axe, or club, as the occasion may demand.

The next period was taken by Superintendent Jones from Erie. It is difficult to describe his method of instruction; it is so peculiarly his own, and so different from all others. His thought is vigorous and the result of long and successful experience in school-work. His illustrations, seized from whatever comes in his way, and set off with inimitable gesticulation, fasten his points of argument so securely that there is little danger of their being lost. His simple yet warm earnestness gives great zest to that sly wit which keeps flashing forth like sparks from a fast-whirling grindstone.

The next period (for work characterized this institute throughout) was taken by Miss Belle Thomas, from Cook County Normal School, Illinois. Her address showed at once the practical and experienced teacher, and the great value of making a thorough study of child-life the measure of all methods of instruction. We were struck by the directness with which she took up the fundamental points of primary teaching, and the promptness with which she met all difficulties, not by any definite routine process in way of a quack recipe suited to all, but by reference to those general principles of human nature, which, when clearly grasped, find application everywhere, whether in lessons of language, or number, or form, or aught else. This one feature of the so-called "new education," emphasized by this able educator, viz., that every method, however time-honored, must be rejected which in any way stands outside of the processes of the child's mind, fettering instead of giving proper freedom to his mental growth, we honor. The higher, as unknown yet knowable, to which we are leading the pupil, must come to the pupil's mind in such a way as to form there a real reciprocal conjunction, or the whole process will be mechanical and not instructive—fact memorization and not mental assimilation.

It was not our privilege to hear the other instructors: but we must not forget to make mention here of a very able essay on physiology and hygiene, read by a thoughtful teacher whose name has escaped our memory. The position taken by the essay was, in our judgment, correct in all points. We were especially pleased to find its literary merit so excellent. It manifested a much larger measure of scholastic culture than ordinary.

Thursday afternoon was given to the Directors. They promptly organized. The hall was filled to overflowing, and deep interest characterized all the proceedings. Addresses were made by Superintendent Jones and others, and in particular by Prof. Cooper, from the Edinboro State Normal School, a veteran school-man, whose crisp, and clear, and thoughtful remarks were of great value both to Directors and Teachers. We dare not criticise the defects of our own brief address through fear of wounding the feelings of Superintendent Luckey, who, with felicitous humor, proclaimed himself as having written it for this occasion.

BELFIELD SCHOOL.

Oakland, Sub-district, 14th Ward, Pittsburgh: Principal, Miss M. A. Hassler.

Friday morning found us in Pittsburgh, to accompany Superintendent Luckey in his visitation of the Belfield school. Rarely have we spent a day more pleasantly or more profitably. The school building is commodious and admirably arranged. During the whole day we examined in detail the method of primary instruction here employed and its results, and were astonished at the proficiency of the young children, and their orderly deportment and good manners. The reading and writing from the lowest grade upward surprised us. Not only from the printed books, but from new arrangements of the assigned lesson written on the black-board, these little boys and girls read with an intelligence and ease rarely witnessed in those of far higher grade.

The Superintendent, to disabuse our mind from any thought of a made-up exhibition, insisted upon our writing on the blackboard a short story. This we tried to do, and a hundred little sparkling eyes eagerly watched

every stroke of the crayon; and when finished, hands flew up and fluttered like blades of corn lifted by the wind. The story was read with hardly a stammer by the very youngest in the room, and was understood as well as it was read. Commencing with the very lowest grade where little blocks, six in number, were handled with great ease, developing the so-called four fundamental principles of arithmetic, we moved to the next grade, and were astonished at its handling of figures. Enumeration was fully mastered, and by a simple process of ones, tens, and hundreds, in their groups of three, moving from hundreds to thousands, and so on as far as the figures might extend. Space forbids any more detailed account of this remarkably well-managed school. It was almost amusing to watch the proud smile on the face of the Superintendent and Principal, saying more plainly than words can, "Now you can see that our theoretical methods mean something, and are not vague and visionary theories of the imagination, but reality, worth fighting for." The day will long be remembered, and has created a strong desire to visit the other schools of this great manufacturing centre of the State.

TWO VERY GOOD LAWS.

AMONGST the school enactments that did get through both Houses at the last session of the Legislature were two modest little bills that do not seem to have attracted much attention; yet, in present wisdom and ultimate permanent influence for good, are amongst the most important of the last quarter of a century.

One is the act authorizing school boards to purchase text-books at the expense of the district, and supply the schools free of cost to the pupils, upon the same principle that other school supplies are furnished at the public expense. Yet so little attention does it seem to have attracted since its publication in the August number of *The Journal*, that so late as November a prominent public speaker, if he was correctly reported, argued in favor of procuring such legislation in the future! not seeming to be aware that such a bill had already been passed, and had received the Governor's approval on the 25th of June last. It remains now for School Directors and Controllers to avail themselves of its provisions as rapidly as local circumstances may permit, and relieve teachers, pupils and parents from annoyance and embarrassment in the attempted classification of pupils and studies, and the smooth working of the schools.

The other act, approved the same day, furnishes an entering wedge to something like permanence in the profession of teaching, by permitting two and three-term contracts with principals and assistants of High and Normal schools, holding proper certificates, instead of engagements as now for only a single term. No very good reason can be urged why it should be thus limited. The grade of certificate should be the guide, rather than the grade of the school. The post of honor is the primary school, and a first-class certificate there should carry with it equal privileges and emoluments with any other grade. The act can be extended hereafter. In the meantime school authorities should profit by it as it is, without any unnecessary delay, and back it up by increased pay as well as an extended term. Permanent employment and living salaries are indispensable pre-requisites to stability and the highest usefulness in the teaching profession.

TEACHERS' EXAMINATIONS AND CERTIFICATES.

THE proceedings of the State Teachers' Association at Harrisburg, in July last, were of exceptional interest and importance, and fully vindicated the traditional standing of the Association as a sentinel upon the ramparts, and a moulding influence in common school affairs. Nothing demonstrated more fully the vigor and vitality of the educational forces of the State than the discussions, frank, earnest and independent, that took place with regard to Normal School Examinations, and Teachers' Examinations and Certificates—subjects that lie at the very foundation of all organized school work, and challenge the best thought of the most intelligent and judicious minds in the educational field.

In enacting the laws under which these examinations are held, no legislative prescience could anticipate every difficulty that might arise, or prescribe details and methods of administration with mechanical accuracy, or mathematical precision. General laws are not so framed and they are never self-administering. That would not be in harmony with the nature of mental operations in such cases as these, where results must necessarily depend more upon administrative insight and fidelity than upon the

cold letter of the law; more upon the breadth and fullness of learning and sympathy in the examiner than upon the narrow technique of the martinet drill-master. As much allowance must be made for the independence and individuality of developing mind as for the waving flexibility of a growing tree. An air-pump and a sucked orange are not the truest ideal of what the process and product of teachers' examinations should be. Perpetual nagging irritates teachers and pupils, and anybody else subjected to it in any sphere of life; and incessant and inquisitorial examinations, that become an end instead of a means, are very naturally depressing in their hindering influence upon aspiration and effort, and their tendency is to measurably retard the very growth they were intended to stimulate as well as measure.

But the recoil from this extreme swing of the pendulum in one direction should not lead to the counterpoise of undue laxity in the opposite direction. There is a just medium contemplated by the law and that our educational interests require, which it is desirable should be maintained from year to year within uniform working limits, without running into hobby or eccentricity in either direction. This is not easy of accomplishment with so many independent factors in the problem, so many separate agencies in the field, each moving in its own orbit, and in possession of its own exclusive jurisdiction. Thirty years ago an attempt was made to reach approximate uniformity in standards and methods, but the qualifications of County Superintendents were, at that day, so unequal and divergent that the intended assimilation was abandoned without getting beyond the stage of preliminary inquiry. Whether it shall ever become practicable must be left for the future to determine.

Prior to 1854, the examinations were made by School Directors themselves, sometimes with the help of the neighboring clergyman or physician; in most cases an idle form, and sometimes not required at all. But if sufficiently close to exclude incapables, rejected applicants had only to go to the next district or county to secure employment, without fear of any unwelcome or disturbing supervision. The school law of 1854 changed all that, by distinctly recognizing teaching as a "profession," and establishing its own independent standard of qualifications, with commissioned officers to enforce it. The 41st section directs certificates to be issued to those "found qualified" and "capable of teaching" the branches named in the certificate; the word "qualified" being in this connection an absolute and not a relative term, and therefore, not open to any latitude of construction; and "capable of teaching" meaning vastly more than mere scholarship, however essential that may be. The applicants are "qualified" and "capable," or they are not. If not, they have no right to a certificate, and cannot legally take charge of a school; which is as it should be. The law was intended to exclude the incompetent and put it out of the power of directors to employ them, whether weakly or wilfully inclined so to do. Conforming to the letter of the law, the first certificates furnished by the Department were professional or permanent certificates, issued broadcast all over the State, in grotesque disproportion to the real qualifications of the great majority of those to whom they were granted. For want of better material, County Superintenents could not do otherwise.

One of the first corrections of this unfortunate condition of things was a notice from the Department limiting certificates to the county in which issued; and subsequently all the permanent certificates, many thousands in number, were annulled in pursuance of circular instructions from the State Superintendent, and new and improved blanks furnished, to be issued only to those really entitled to them. In the meantime, under the pressure of necessity, the graded provisional or temporary certificate was tried as an experiment, good for one year only and afterwards limited to a single term, according to the judgment of the superintendent issuing it. This permitted the brief employment of partially-qualified teachers because better ones could not be had, and prevented the closing of the schools on that account, or the wrongful issue of permanent certificates, this being the least objectionable horn of the dilemma.

It was supposed that the Provisional certificate would have only a temporary place in our school economy; that in a few years at farthest, there would be no occasion for its use, and it could be laid aside as part of the discarded scaffolding of an obsolete transition period. How widely mistaken and illusory this hope has been, let history answer. So far from falling into disuse, it seems to have secured firmer footing and a stronger hold upon our educational policy; and by formal resolution of our State Teachers' Association it is gravely proposed to lift it into practical equality with Professional certificates—the holders of the latter

not seeming to realize that, in thus opening a wider door to the competition of inferior qualifications, of which not a few directors will be quick to take advantage, they will be cutting the ground from under their own feet, and may ultimately leave themselves without a vocation, or at least find the field of labor greatly circumscribed in which to exercise it. The most that could, with propriety, be claimed for the temporary certificate would be that when No. 1 has been fairly reached in any branch, no further examination should be required in that branch; leaving other branches and the all-controlling "art of teaching" to be brought up to grade as soon as may be practicable.

College diplomas are worth nothing of themselves as passports to teaching in the elementary common schools, whatever they may or may not signify as to scholarship in the higher range of studies, unless the holders were thoroughly trained in good common schools before entering college. These diplomas may mean much or little, but there is nothing on their face or the mere fact of their possession, to indicate teaching skill and aptitude, or a sufficient knowledge of the rudiments. This has been demonstrated over and over again during the last thirty years, and justifies the legal barriers that were intended to dyke out the educated illiterate and unlettered ignorance alike, from intrusion into the sacred forum of common school work—that priceless heritage of the great mass of the rising generation.

One great trouble is that the salutary defensive provisions of the law are not maintained with sufficient firmness. The bars are let down when they ought to be kept up, and herein is a great wrong to school children. The common schools were not established for the accommodation and emolument of needy people temporarily out of employment, but for the thorough tuition and training, by skilled workmen, of the pupils who attend them; and to this end the rejection of incompetent applicants becomes an imperious duty, no matter who may be disobliged. Directors, if true to their trust, will then seek higher qualifications, and, where the resources of the district will permit it, pay better salaries, the latter being the best incentive to improvement and good professional work, which it is the object of our school system to secure. The weak point in the system lies right at the schoolhouse door, just where it should be strong and strongly fortified, as the law intends. The commissioned officer on guard is responsible for the weakness, if he does not rise to the height of his great opportunities, and, when occasion calls for it, courageously exercise, in defense of his charge, the ample and mandatory powers with which the law, for wise purposes, has clothed him.

In regard to Normal School instruction and examinations, it is a fundamental truth, in every age, the wide world over, that "the teacher makes the school." Hence like qualifications will produce equal results if there be the same grade of material to work on. All these conditions enter into the solution of the problem. If the corps of instructors in the several schools be substantially equal in mental calibre and resources, aptitude in teaching, wealth of scholarship, and knowledge of human nature, and the classes come up to the Normal course with the same average talent and preparatory training, there would be no room for cavil, no ground for dissatisfaction, if the examinations be correspondingly fair and philosophical.

Going to the root of the matter, it will be found in most cases that it is not the examinations that are so much at fault, as the previous instruction that the examinations are to test. The same examination questions might be sent out to all the schools at once, in cipher for safe keeping, and be honestly used in good faith, on the same days and at the same hours, and yet the examination papers and markings be no more uniform and satisfactory than now, owing to the difference in methods and thoroughness of instruction, and the preparatory fitness of pupils to profit by them.

If the Normal Schools possessed ample pecuniary resources, to reach out for the most accomplished instructors that money could command, from whatever source at home or abroad, the first difficulty could readily be overcome, and the second, about examinations, would soon fade out of sight. But taking things as we find them, the remedy for these obvious embarrassments does not lie so near the surface, and cannot be so speedily achieved. Neither power nor resources are within immediate reach, and, as with many another difficulty in school administration, time and patience, and the slow-moving tides of human endeavor, must be relied upon to gradually adjust in the future what cannot be immediately remedied in the impatient present.

School directors have a right to demand that identical documents shall mean the same thing when presented as legal vouchers for employment in the schools under their charge; and if that cannot be assured, and differences discovered are so great as to be a

disturbing element in school management, it might be well, as at least a partial remedy until we can do better, to follow the analogy of the decree that originally limited permanent certificates to the county in which they were issued, and protect more advanced portions of the State against inroads from the less progressive, by limiting Normal school certificates to the Normal district in which issued; unless a conversational examination by a skillful county superintendent, of twenty-five or thirty minutes' duration—which would be sufficient for the purpose if intelligently conducted—should show that it was worthily held, and could therefore safely be endorsed for service outside of the first jurisdiction. The examinations as now held being mainly local, the certificates issued could without impropriety be localized also, in the manner and to the extent here indicated. Practical remedies are always in order in dealing with practical difficulties, without closing the door against any others that may be suggested.

OFFICIAL DEPARTMENT.

DEPARTMENT OF PUBLIC INSTRUCTION,
HARRISBURG, December, 1885.

THE annual sessions of the Teachers' Institutes, yet to convene in their respective counties, will be held at the times and places here named, as reported to the Department.

County.	*Post Office.*	*Date.*
Adams	Gettysburg	November 30.
Blair	Hollidaysburg	November 30.
Cumberland	Carlisle	November 30.
Huntingdon	Huntingdon	November 30.
Northampton	Easton	November 30.
Bedford	Bedford	December 7.
Carbon	Lehighton	December 7.
Lackawanna	Scranton	December 7.
Pike	Milford	December 7.
Snyder	Middleburg	December 7.
Bradford	Towanda	December 14.
Elk	Ridgway	December 14.
Juniata	Mifflintown	December 14.
Luzerne	Wilkes-Barre	December 14.
Lycoming	Muncy	December 14.
Mercer	Mercer	December 14.
Perry	New Bloomfield	December 14.
Beaver	Beaver	December 21.
Clarion	Clarion	December 21.
Clearfield	Clearfield	December 21.
Jefferson	Brookville	December 21.
Schuylkill	Shenandoah	December 21.
Union	Mifflinburg	December 21.
Armstrong	Kittanning	December 28.
Butler	Butler	December 28.
Centre	Bellefonte	December 28.
Columbia	Bloomsburg	December 28.
Fayette	Uniontown	December 28.
Fulton	McConnellsburg	December 28.
Indiana	Indiana	December 28.
Montour	Danville	December 28.
Northumberland	Sunbury	December 28.
Somerset	Somerset	December 28.
Venango	Franklin	December 28.
Westmoreland	Greensburg	December 28.
Wyoming	Tunkhannock	December 28.
York	York	December 28.
Sullivan	Dushore	Jan. 4, 1886.
Forest	Tionesta	January 5.
Monroe	Stroudsburg	January 11.

QUESTION ANSWERED.

11. QUESTION.—Was there an act passed at the last session of the Legislature which prohibits boys under fourteen years of age from working inside of mines, and boys under twelve years from working in the coal breakers?

Answer.—The law relating to employment of boys in mines, etc., is Section 16 of "*An Act relating to bituminous coal mines, and providing for the lives, health, safety, and welfare of persons employed therein,*" approved June 30, 1885. It reads as follows: "No boy under the age of twelve years, and no woman or girl of any age, shall be employed or permitted to be in any bituminous coal mine for the purpose of employment therein; nor shall any boy under the age of ten years, or any woman or girl of any age, be employed, or permitted to be in or about the outside structure or workings of any bituminous mine or colliery, for the purpose of employment; *Provided, however,* That this provision shall not affect the employment of a boy or a female of suitable age in an office, or in the performance of clerical work at such mine or colliery."

PERMANENT CERTIFICATES GRANTED.

No.	Name.	Post Office.	County.	Issued 1885.
3957	C. H. Brosius	Brookville	Jefferson	July 29
3958	Sarah J. McIntyre	Catasauqua	Lehigh	" 31
3959	Theo. W. Tressler	Juniata	Perry	" 31
3960	A. M. McCaskey	Sherman's Dale	"	" 31
3961	John L. Hain	Acker	"	" 31
3962	James J. Grubb	Liverpool	"	" 31
3963	E. S. Henry	New Bethlehem	Clarion	" 31
3964	G. W. Williams	Boalsburg	Centre	" 31
3965	Sue M. Zuver	Duke Center	McKean	" 31
3966	G. W. W. Blair	Carmichael's	Greene	" 31
3967	Lotta Colson	Wind Ridge	"	" 31
3968	Ida E. Foster	Lincolnville	Crawford	Aug. 6
3969	Mary M. Gallaher	New Washingt'n	Clearfield	" 6
3970	Hiram P. Hewitt	Sylvis	"	" 6
3971	Hannah Jenkins	Pittsburgh	Allegheny	" 17
3972	Laura Warner	Wilcox	Elk	Sept. 7
3973	Amanda L. Wilcox	"	"	" 7
3974	Lizzie M. Fisher	Lincolnsville	Crawford	" 19

ITEMS FROM REPORTS.

ARMSTRONG.—Sup't Stockdill: We never had so many teachers as this year. There are plenty of good teachers, and too many that would be teachers. We had to reject four out of seven in some classes. Times are dull and nearly everybody wants to teach for a livelihood. Such things should not be. In some townships the salaries have been reduced, and consequently they are getting inferior service. It pays to employ good teachers at a good salary.

BERKS. — Sup't Keck: The Womelsdorf teachers hold a weekly Institute. The Birdsboro' Grammar School, Annie D. Price teacher, held an entertainment, and with the proceeds purchased a Kendall's tellurian. The Hamburg directors enclosed the Oak Street school property with a neat fence, and improved the building. The Kutztown Board re-furnished one room with improved furniture. The Union school directors have repaired all their schoolhouses; they also employed an assistant for the Mt. Airy School. The great school event for the month was the meeting of the annual Institute. We had first-class instructors, among whom may be named Dr. E. E. Higbee, Dr. N. C. Schaeffer, Dr. E. E. White, Dr. A. R. Horne, Prof. E. L. Kemp, Sup't T. M. Balliet, and Prof. D. B. Brunner; and the following evening lecturers: Russell H. Conwell, Geo. W. Bain, and James Hedley. The attention given to the work, and the interest taken therein, are sure indications of good results to follow. All but nine of the 457 teachers attended. Those nine need no instruction (?).

CHESTER.—Sup't Harvey: Our county Institute was largely attended, only six teachers absent. Arbor Day being wet, some of our schools observed the following day. Most of our school grounds are well shaded.

CLARION.—Sup't McNutt: An Educational Association meeting was held at Greenville, Oct. 16th and 17th. The attendance was fair and considerable interest was manifested. The new school building in Clarion Borough will be completed by January 1st, 1886. New school houses have been built during the past summer, in several districts. The directors in Beaver district have placed new furniture in five houses; all their houses now have patent desks.

CRAWFORD.—Sup't Sturdevant: The annual Teachers' Institute was the largest ever held in this county. Dr. E. E. Higbee, Dr. L. R. Klemm, Sup't George J. Luckey, Sup't H. S. Jones, Prof. J. A. Cooper, Miss R. R. Benn, and Miss Belle Thomas took part. Dr. Klemm, Hon. E. A. Apgar, and Mrs. Mary A. Livermore lectured; Mrs. J. C. Hull sang at the concert. The enrollment exceeded 700.

DAUPHIN.—Sup't McNeal: There is a full attendance in all the borough schools of the county, some of them being very much crowded, Williamstown has two schools, each of which has an enrollment of over a hundred pupils. The School Board of Steelton has just published a report of the schools of that enterprising borough, The pamphlet contains a statistical and written report from the principal, Mr. McGinnes, covering the last three school years, their revised course of study, the text-books used, and other miscellaneous information concerning the schools and their work. Steelton has taken advantage of the law authorizing directors to furnish free text books. This year the Board is supplying all the Geographies used in the schools. Next year other books will doubtless be placed on the free list.

HUNTINGDON.—Sup't Brumbaugh: We are not dead to any important educational movement, nor are we lacking in its observance. Our Arbor Day was a success and *generally* observed. The accompanying letter was published in the county papers. [This letter of Sup't Brumbaugh to the teachers of Huntingdon is very practical, touches essential points admirably, and occupies the space of a newspaper column.—*Ed.*]

JEFFERSON.—Sup't Hughes: The grade for teaching has been considerably advanced, and the teachers have made corresponding improvement. No certificate lower than "2" has been issued to any applicant during this year's examinations; all below "2" were refused. Our schools are doing good work. The directors in many districts are putting in new furniture. Warsaw has supplied all its schools, eleven in number, with beautiful and substantial patent furniture. This is characteristic of the intelligence of the present Warsaw Board.

MONTGOMERY.—Sup't Hoffecker: The annual county Institute was a complete success. The instruction given was thorough and practical; the discussions were earnest and pointed. Both teachers and directors were highly pleased with Deputy Sup't Houck's instructions. The attendance of teachers and directors was the largest ever reached in the county. Directors' day was a very profitable one. The papers read and the discussions by the various directors have given an impetus and aroused an enthusiasm that will be felt in every district,

POTTER.—Sup't (Miss) Buckbee: Our county Institute was interesting and profitable. Daily class-drills were given by Prof. Evans, which, we think, must aid young teachers in their work this winter. A county reading circle was organized.

SNYDER.—Sup't Dill: Two rooms are being refurnished in Washington township. The examinations were well attended by directors and citizens, and great interest was manifested. I am looking forward to a very successful term. Teachers are better prepared for their work than hitherto, and our people are fully aroused.

SOMERSET.—Sup't Weller: The public examinations were well attended by the people. The number of applicants has been greater than last year. The local normal schools have been well attended and a good corps of teachers can be selected.

CORRY.—Sup't Colegrove: The schools of this city opened with an increased attendance. Since my last report an elegant new brick school building, containing four rooms, has been completed. It is so constructed as to secure adequate heat, ventilation and light, and is an entire success. The high school building has

also been overhauled and has been supplied with new heating and ventilating apparatus. Some useful philosophical instruments have been placed in the high school laboratory.

ERIE.—Supt. Jones: On Monday, the 26th of October, school building No. 3, recently constructed, was opened to regular school work. The house contains six school-rooms, a teachers' room, with closets attached for clothing, apparatus, etc. The Erie school buildings as a class excel in light, room and convenience, but it is held that No. 3, the last effort of the school board, leads all others. The house has more available light and blackboard than any other in the city. Some points may be mentioned that are features of the Erie school-houses: 1. The amount of light is based on over 350 square inches of glass to each pupil. 2. The size gives about 16 square feet of floor to a pupil. 3. Every door has a large transom window over it, that can be opened easily more or less. 4. The blackboards fill every space between doors and windows, and are from five to seven feet wide, low down, so that children can use them easily. 5. The wardrobes are so arranged that they cannot be entered except through the respective schoolrooms to which they are attached. 6. The stairs have broad tread and but six-inch risers. 7. The basements are high enough above ground to allow of large windows, and they average eleven feet between joists. 8. The main halls are broad, fifteen to twenty feet, and well lighted, outer doors opening either way. Building No. 3 is warmed and ventilated on the Ruttan system, which uses large volumes of warm air, which pass from the heaters into the rooms, then under the floors to the foul air stack.

MAHANOY CITY.—Sup't Ballentine: During the month a new primary school has been opened, making the number of schools in the town twenty-three. We are now well supplied with excellent school-room accommodations. None of the schools are crowded, and all but one are furnished with modern furniture. Besides these needful provisions, what is still more important, the schools are well taught and trained by a faithful and efficient corps of teachers.

YORK.—Sup't Shelley: Commendable interest has been shown by many pupils in the observance of the fall Arbor Day, by planting trees in their yards at home. There is little room left for additional trees on our school grounds; a few yards, on account of location, have been paved.

LITERARY DEPARTMENT.

DURING the next year, 1886, we shall have several practical articles on the subject of *School Libraries*, How to Start them, their Management, Use, Constitution, etc., and shall devote particular attention to the notice of books *specially suited for School Libraries*. It is a subject that is daily being more fully recognized, by thoughtful and progressive educators, as second in importance to no other; and we shall endeavor to give all the assistance we can, especially in the difficult matter of selection of the best books.

To the important movement in the direction of organizing and conducting *Teachers' Reading Circles*, we shall contribute what we may of suggestion and encouragement. The Reading Circle has taken firm hold in a number of States, and has a future of great usefulness before it. The lists of books adopted varies so greatly in different localities as to excite surprise, but one thing is clearly evident—while giving a fair share of attention to the literature of pedagogics, the course *must not be too professional.*

CHRISTMAS PRESENTS.

The pleasant custom of an interchange of Christmas gifts between the teachers and scholars in our schools, is growing from year to year. It is in itself to be heartily commended as tending to foster mutual confidence, and a closer affection, and in so far promoting the right conditions of true discipline and sound education. As very commonly indulged in, however, it is open to earnest criticism. Too many of the ordinary Christmas presents, not only in our schools but in our families and between friends as well, lack the essential elements of appropriateness and usefulness, and where these are not present, there is often a waste of money involved as compared with the giving of gifts that are both appropriate and of permanent use and value to the recipient.

The Christmas feast is a time of glad abundance. But Christmas green and Christmas cheer have now too much associated with them the thought of fruits and confections; oranges and raisins, figs and almonds, and the endless waste of the confectioner's art, occupy too large a space in the world's thought of the day; and the wassail bowl of ruder times still holds sway too strong in Christian lands. The good-will usually manifested in the distribution to pupils, at this season, of nuts and fruits and candies in moderate supply, and the pleasant memories of such an occasion that may be cherished for a life-time—are in the spirit of the day. But may it not have some more fitting observance?

Christmas has grown to be too much of a mere carnal feast, as has just been said—a time of eating and drinking, and of gratification of the bodily senses. Let not our schools assist in this evil tendency. But let them rather help to stem and counteract it, by doing what they can towards making the season a soul and mind feast, an occasion for stimulating the spiritual energies, for upbuilding and improving the faculties of mind and heart. In a word, let teacher and scholar, then, not indulge too largely the habit of giving presents to one another that are eaten up in a few hours, that minister only to the bodily senses, and that have no proper relation either to the holy season or to the work of edu-

cation; and instead let their gifts consist of that which ministers preëminently to the higher faculties of man, which lasts as long as life itself, and which directly falls into line with the character and work of our schools—*Books*.

Whether as rewards of merit, as mementoes, or as the expression of Christmas greeting and affection; for appropriateness and for usefulness; under all considerations and circumstances, *Books* are the most sensible, economical, practical, lasting and best gifts that can be given. Have you a scholar in your class whom you particularly wish to interest in literature, and to get into the habit of reading? Give that scholar some well-chosen book as a Christmas present. If he never read a book before, rest assured he will read this one, simply because "My teacher gave it to me!" There is no more certain method of starting a child in the reading habit. And so in a hundred different ways the judicious teacher can use this custom of Christmas presents as one of the most effective instruments in the work of moulding, guiding, leading, educating the minds and characters of his scholars.

For the help of those who take enough interest in their high calling to act upon our hint, we name a few books, not specially so-called "holiday books," which will be found suitable for Christmas gifts.

Among all the multitude of gayly-embellished "holiday books" there is scarcely one that, for attractiveness of make-up, the interest and instructiveness of its contents, and at the same time reasonableness in price, deserves to be more popular than Lieut. Schwatka's *Nimrod in the North* (New York: Cassell & Co, $2.50). In it the author gives in vivid style a narrative of hunting adventures in the Arctic regions, which are illustrated by numerous excellent engravings. The boy who gets this book will be wild with delight, and will not need any urging to read it through, while he cannot read it without gaining therefrom a considerable store of geographical knowledge and useful facts in natural history. Less highly ornamental, though not less interesting and instructive are the first three volumes of the "*Illustrated Library of Wonders Series*" (New York: Charles Scribner's Sons, $1.00 per vol.) For interesting the young reader in the further study of Natural History, the volume on "*The Intelligence of Animals*" is just the thing. It is a veritable cyclopædia of true stories and anecdotes of animals, showing the high grade of intelligence of which they are capable. It will be read with intense interest and great profit by every healthy young person. For the boy or girl of a historical turn of mind, the volume on "*Rameses the Great, or Egypt 3300 Years Ago*" will be an unfailing source of pleasure and a strong incentive to study further into the strange history of that strange old land of the Pyramids and Sphynx. The young scientist, on the other hand, will find the latest results arrived at on the subject of heat, given in a charmingly clear manner, in the volume on "*The Phenomena and Laws of Heat*." These volumes are all translations from the works of French specialists, written in a vivacious style, and fully illustrated. No books in the language are better adapted to arouse in the intelligent young mind a desire and impulse to engage in the study of the sciences to which they are such excellent introductions. The same service will be done for legal and political science by giving the boy or girl a copy of "*The Traveling Law School*," (Boston: D. Lothrop & Co. $1.00), in which Benj. Vaughn Abbott, starting at the State House at Boston, takes them through New York, Philadelphia, and to Washington, and tells and shows them, in a most interesting way, all the essential facts about municipal, state, and national government and law, just those facts which every young American ought to know. Half of the book is devoted to an account of "Famous Trials." The plan of the volume and its execution are equally excellent. Of a more general character is Mrs. Sarah K. Bolton's book, "*How Success is Won*" (Boston: D. Lothrop & Co. $1.00), with its brief biographies and good portraits of twelve of our eminently successful men, all told in such a manner as to bring out clearly the true elements of success everywhere, and to inspire the young reader with high and noble aims and ambitions. Among the "successful men" described are Peter Cooper, John B. Gough, John G. Whittier, John Wanamaker, Henry M. Stanley, Elias Howe, Alex. H. Stephens, Dr. J. H. Vincent, Edison and others. In the same style is also this author's "*Lives of Poor Boys who Became Famous*" (New York: Thos. Y. Crowell & Co., 12mo. $1.50), a handsome volume with good portraits of men like George Peabody, Greeley, Palissy, Garrison, Farragut, and numerous others, whose biographies are sketched with exquisite taste and skill, and make a book which no boy can read without being strengthened and made better thereby. We are sure too that a present of so attractive a work as "*A Brief History of the United States* (New York: A. S. Barnes & Co., 12mo. $1.25), with its profusion of illustrations, would be acceptable to any bright boy or girl. It tells the story of our country in a vivacious style, and above all it brings it up to the funeral of General Grant in August, 1885, President Cleveland's portrait being the last in the book. For older scholars Col. Higginson's excellent "*History of the United States*" (New York: Harper & Brother, 8vo. $3.00), would be more appropriate. It brings the history to the close of Jackson's presidency, is written in a masterly manner, being especially full on the times prior to the actual colonial period. Indeed, Col. Higginson's account of the Norsemen in America, of the mound-builders, cliff-dwellers, and other such subjects seldom touched on in the ordinary history, gives a special and permanent value to this beautiful volume. Its many illustrations of colonial life and customs, as well as its portraits, are all exceptionally fine. It is a book well worthy a place in any library. More popular in form and adapted for younger readers, without being childish, are the excellent "*Little Arthur's Histories*," of England and of France, (New York: T. Y. Crowell & Co., 12mo. $1.25 per vol.)

Among juvenile histories we know of none better, and certainly none that are published in handsomer style, or that will be more likely to arouse and hold the attention and interest of the young reader. Let teachers give their scholars some such presents as these, and they will soon feel the benefit themselves in the increased attention and efficiency manifested in their classes.

But scholars also want to give Christmas gifts to their teachers, and the teachers themselves have adult friends whom they wish to remember. In both cases again books are the best presents that can be made.

And among them all, as a gift of a school to its principal, or a class to its teacher, no work could be more appropriate, useful and acceptable than the series of *American Men of Letters*, which have been described in previous numbers of THE JOURNAL. Equally useful and appropriate would be the companion series of *American Commonwealths* (Boston: Houghton, Mifflin & Co. $1.25 per vol.), which we shall describe more fully in a future number. Suffice it to say here that nothing in popular historical writing has been done in this country to excel these volumes in combined interest and thoroughness. Each volume treats of one of the United States, is written by a specialist on the subject, and has all the value of an authority. Six volumes are so far ready, uniformly bound, gilt top, and the whole done in the excellent style for which the Riverside Press is famous. The volumes issued are Virginia, Maryland, Michigan, Kentucky, Oregon and Kansas. Pennsylvania is soon to follow. The same publishers have also just issued another work, *The Life and Correspondence of Louis Agassiz* ($2 per vol.), by the late eminent scientist's daughter, in two most elegant octavo volumes, gilt top, and beautifully printed and illustrated, making it a specially handsome and valuable present. The first volume gives the life of Agassiz from his birth on May 18th, 1807, to the end of his European residence, where he was famous as a scientist, and on terms of correspondence with men like Schelling, Oken, Döllinger, Cuvier, Humboldt and others, before he came to America in 1846, at which time the second volume commences, and gives a full and most interesting account of his work as professor at Cambridge, his important coast and lake explorations, lecturing tours, life in South Carolina, journey to South America, his great work of founding the Museum of Comparative Zoology at Cambridge, etc., until his death December 14th, 1873. A boulder from the glacier of the Aar marks his resting place in Mt. Auburn cemetery. An inspiring life and book.

Of quite a different character, but not less interesting, is "*Boots and Saddles*," or Life in Dakota with Gen. Custer (Harper & Brothers. $1.50), written in an unassuming, affectionate style by the widow of that dashing cavalryman. It gives a very graphic account of life on the plains, the hardships and enjoyments, the bright and dark experiences of camp and barracks and frontier fort. Its unconscious revelation of Mrs. Custer's own beautiful and devoted true womanly character will to many be the most charming feature of the whole book. Two recent novels should also be mentioned here as making suitable presents. The best one of them is "Charles Egbert Craddock's" latest and most perfect work, "*The Prophet of the Great Smoky Mountains*," (Boston: Houghton, Mifflin & Co. $1.25.) It is a novel worth preserving; thoroughly American in every respect, and by a young lady who seems to have a great reputation before her. Its characters are all original, clearly painted, and vigorous, living, intensely real persons. Its descriptions of Tennessee mountain scenery are magnificent, and some of the situations, as the gander pulling, the scene in the meetin' house when the prophet is arrested, the illicit whisky still in the dark cavern with its band of gnome-like moonshiners, and finally the mistaken vengeance of these latter, are full of intense dramatic power. While through all runs a sweet, tender and pathetic love story of the purest kind. We are less pleased with Bret Harte's latest story, *Maruja*, (Houghton, Mifflin & Co. $1.) It is highly interesting and very artistically written, and gives a good idea of Mexican high and low life. But neither in plot nor character does it seem to us to be up to Mr. Harte's best. The fact is, there has been very little really first-class work done in recent fiction in this country. All the more satisfactory is it therefore to be able to turn to such perpetual favorites as "*Uncle Tom's Cabin*," given us in a new and improved dress, and at a cheaper price than ever before (Houghton, Mifflin & Co. $1.) It is one of those books that every individual American should read, not only because it has become a historic book in the truest sense, a part of our history, but also for its own merits and its altogether wholesome influence. Mrs. Stowe gives a very interesting history of the book itself in this edition. If you have a friend, old or young, who has not yet read it this is the book to give him. Another ever-new old book is Irving's charming "*Rip Van Winkle*" (New York: Arthur Hinds), printed and bound in unique and tasteful style on pale green paper, a feature of the "Amsterdam Edition." It is prettier mechanically than any Christmas card, and costs less, and lasts as a thing of beauty and usefulness for an indefinite time. Finally there are Lowell's inimitable "*Biglow Papers*," (Houghton, Mifflin & Co. $1 per vol.), in two volumes of the exquisite Riverside Aldine series, than which nothing more convenient and at the same time beautiful in form has been produced in this country for many a year. All the volumes of this series are models of the printer's and binder's taste and skill, a delight to the sense of sight and touch alike, while their contents are the very cream of American literature. Nor must we forget to mention among the most beautiful and useful Christmas presents, Houghton, Mifflin & Co.'s series of Calendars, Emerson's, Longfellow's, Whittier's, Holmes's, and the new ones issued this year, the Lowell and the Whitney Calendars. They are all differently ornamented, and each seems more beautiful than the other. One of them, at least, ought to be in every school room. ($1 each.)

RELIGION is reproached with not being progressive; it makes amends by being imperishable. The enduring element in our humanity is not in the doctrines which we concisely elaborate, but in the faiths which unconsciously dispose of us, and never slumber but to wake again. What treatise on sin, what philosophy of retribution, is as fresh as the fifty-first Psalm? What scientific theory has lasted like the Lord's Prayer? It is an evidence of movement that in a library no books become sooner obsolete than books of science. It is no less a mark of stability that poetry and religious literature survive, and even ultimate philosophies seldom die but to rise again. These, and with them the kindred services of devotion, are the expressions of aspirations and faiths which forever cry out for interpreters and guides. And in proportion as you carry your appeal to those deepest seats of our nature, you not only reach the firmest ground, but touch accordant notes in every human heart, so that, inevitably, the response turns out a harmony.—*Dr. Martineau.*

TOUCH NOT THE CUP.

T. H. BAYLY.
JAMES H. AIKMAN.

1. Touch not the cup, it is death to thy soul; Touch not the cup, touch not the cup;
2. Touch not the cup when the wine glistens bright; Touch not the cup, touch not the cup;
3. Touch not the cup, young man, in thy pride; Touch not the cup, touch not the cup;
4. Touch not the cup, oh, drink not a drop; Touch not the cup, touch not the cup;
Ma - ny I know who have quaffed from that bowl; Touch not the cup, touch it not.
Though like the ru - by it shines in the light; Touch not the cup, touch it not.
Hark to the warn - ing of thousands who've died; Touch not the cup, touch it not.
All that thou lov - est en - treat thee to stop; Touch not the cup, touch it not.
Lit - tle they thought that the demon was there, Blindly they drank and were caught in the snare;
Fangs of the ser - pent are hid in the bowl, Deep - ly the poi - son may en - ter thy soul,
Go to their lone - ly and des - o - late tomb, Think of their death, of their sorrow and gloom;
Stop! for the home that to thee is so dear, Stop! for the friends that to thee are so near,
Then of that death-dealing bowl, oh, be - ware; Touch not the cup, touch it not.
Soon will it plunge thee be - yond thy con - trol; Touch not the cup, touch it not.
Think that perhaps thou may'st share in their doom; Touch not the cup, touch it not.
Stop! for thy coun - try, in trembling and fear, Touch not the cup, touch it not.

I FEEL sore at heart now. One of the noblest natures that used to sit in these seats, one I loved and who loved me; whose hand was as large in its generosity as a prairie; who had all the prospects of a noble and useful life, who could restrain himself and stop when he'd a mind to. But he has gone down to such a degree in intemperance that his friends have given him up in despair. How many of that kind have I seen; and the time as it passed did not suffice for him, or for them. They say: "To be sure I smoke; but only seven to ten cigars a day; but it is not a necessity for me—I can give it up." Or, "I know I drink a little; but it is not a necessity for me; I can give it up to-day." But they don't; and they don't next year, or the year after; and when they hear the roar of the tide of perdition, over the verge of which they will plunge finally, they can't. The time when men ought to stop is when they first see the peril; when there is time enough for judgment, enough to bring the higher qualities of the mind to sit in judgment over the lower.—*Beecher.*